

M8920B PXIe Radio Test Set

100 kHz to 6 GHz

Unlock the Future of Radio Test

Field radios are a vital lifeline for public safety, firefighters, and peacekeepers. That's why the new Keysight M8920B is designed to validate the excellence you expect from your radio. All along your lifecycle, we open capabilities that range from deep analysis in design to fast testing in production.

Accelerate Radio Manufacturing

Digital 2-way radios being developed for the radio market bring new testing challenges and hurdles to overcome for manufacturers and depot testing. Radio technologies are requiring wider bandwidths, higher frequencies, and multiple radio format capabilities.



Figure 1. M8920B Radio test set

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Product Description

Keysight's M8920B PXIe Radio Test Set consists of PXI hardware with application-specific software, providing flexible and scalable multi-format coverage for current and next-generation radio testing.

With Keysight's Radio Test Measurement Application (N9093), you can access and control multiple views on one screen to simultaneously monitor critical measurements. Keysight can help deliver the operational excellence you expect from your radio.

Applications

- Test all necessary analog AM/FM/PM modulation types and APCO P1/P2, TETRA1/2, DMR, dPMR, as well as custom modulation formats
- Supports commercial connectivity formats including 5G, LTE, WLAN, and *Bluetooth®*
- All measurements can be performed with one click of a button
- With 89600 VSA software, you can troubleshoot your new radio designs
- Test high power radios up to 200-watts

Technical Specifications

Definitions and conditions

Specifications describe the warranted performance of calibrated instruments. Data represented in this document are specifications under the following conditions unless otherwise noted.

- Specifications are valid from 45° to 75 °C for individual module temperature, as reported by the module, and 20° to 35 °C for environment temperature unless otherwise noted
- Calibrated instrument has been stored for a minimum of 2 hours within the allowed operating range
- If instrument has previously been stored at a temperature range inside the allowed storage range, but outside the allowed operating range, instrument must have been stored for a minimum of 2 hours within the allowed operating range before turn-on
- 45-minute warm-up time
- Calibration cycle maintained
- The RF, IF, and Source Alignments have been run within the previous 7 days
- An "Align ALL" has been run within the previous 8 hours
- If the temperature has changed more than 5 °C from the previous "Align ALL"

Typical describes additional product performance information that is not covered by the product warranty. It is performance beyond specifications that 80% of the units exhibit with a 95% confidence level. This data, shown in italics, does not include measurement uncertainty, and is valid only at room temperature (approximately 25 °C) after alignment within the stated alignment time and temperature limits.

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.

Recommended best practices

- Use slot blockers and EMC filler panels in empty module slots to ensure proper operating temperatures. Keysight chassis and slot blockers optimize module temperature performance and reliability of test.
- Set chassis fan to high at environmental temperatures above 45 °C
- Testing radios > 50 watts should be done in a climate-controlled environment to minimize thermal stress on the radio test set hardware.

RF analyzer technical specifications and characteristics

Frequency range

Option 506	100 kHz to 6 GHz
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Analysis bandwidth ¹	Center frequency (CF)	Analysis bandwidth
Option B3X (standard)	100 kHz – 1MHz	50 kHz
	1 MHz – 10 MHz	500 kHz
	10 MHz – 20 MHz	5 MHz
	20 MHz – 60 MHz	10 MHz
	60 MHz – 80 MHz	20 MHz
	80 MHz – 380 MHz	40 MHz
	380 to 550 MHz	100 MHz
	550 to 1310 MHz	200 MHz
	1310 to 6000 MHz	300 MHz

1. Instantaneous bandwidth (1 dB 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.

Frequency resolution

RF analyzer	0.01 Hz (nominal)
Resolution Bandwidth (RBW)	Auto, 1 Hz to 8 MHz, I/Q Analyzer up to 300 MHz

Frequency accuracy – same as accuracy of internal timebase or external reference input

Internal timebase accuracy ¹	$\pm [(\text{time since last adjustment} \times \text{aging rate}) \pm \text{temperature effects} \pm \text{calibration accuracy}]$
Yearly aging rate	$< \pm 0.1 \text{ ppm/year } (\pm 1 \times 10^{-7})$
Achievable initial calibration accuracy	$\pm 4 \times 10^{-8}$
Residual FM	$\leq 0.25 \text{ Hz p-p in 20 ms nominal}$
Temperature effects 20 to 30 °C	$< \pm 1.5 \times 10^{-8}$

1. Calibration accuracy depends on how accurately the frequency standard was adjusted to 10 MHz. If the adjustment procedure is followed, the calibration accuracy is given by the specification. Achievable Initial Calibration Accuracy.

Triggering

Trigger	Free run, external 1, external 2, RF burst, video, periodic
Trigger delay range	-150 to 500 ms

Amplitude range and accuracy specifications (T/R input port and antenna input port)

Antenna input port	Range: -70 to +23 dBm	100 kHz to 1 MHz	± 0.6 dB typical
		1 MHz to 2 GHz	± 1.25 dB, ± 0.6 dB typical
		2 GHz to 3.9 GHz	± 1.5 dB, ± 0.8 dB typical
		3.9 GHz to 6 GHz	± 1.6 dB, ± 0.9 dB typical
T/R port high power attenuation ON	Range: -30 to +47 dBm	100 kHz to 1 MHz	± 0.4 dB typical
		1 MHz to 2 GHz	± 1 dB, ± 0.5 dB typical
		2 GHz to 3.9 GHz	± 1.2 dB, ± 0.5 dB typical
		3.9 GHz to 6 GHz	± 1.3 dB, ± 0.5 dB typical
T/R port high power attenuation OFF	Range: -50 to +30 dBm	100 kHz to 1 MHz	± 0.6 dB typical
		1 MHz to 2 GHz	± 1 dB, ± 0.5 dB typical
		2 GHz to 3.9 GHz	± 1.3 dB, ± 0.6 dB typical
		3.9 GHz to 6 GHz	± 1.4 dB, ± 0.6 dB typical

Amplitude range and accuracy specifications (M9472A T/R input port)

High power attenuation ON	Range: -30 to +53 dBm	100 kHz to 1 MHz	± 0.4 dB nominal
		1 MHz to 2 GHz	± 0.6 dB nominal
		2 GHz to 3.9 GHz	± 0.8 dB nominal
		3.9 GHz to 6 GHz	± 0.9 dB nominal
High power attenuation OFF	Range: -50 to +36 dBm	100 kHz to 1 MHz	± 0.7 dB nominal
		1 MHz to 2 GHz	± 0.7 dB nominal
		2 GHz to 3.9 GHz	± 0.9 dB nominal
		3.9 GHz to 6 GHz	± 1 dB nominal

Maximum RMS safe power input

M9470A T/R port high power attenuation ON	+47 dBm (50 W)
M9470A T/R port high power attenuation OFF	+33 dBm (2 W)
M9470A RF antenna port	+30 dBm (1 W)
M9472A T/R port high power attenuation ON	+53 dBm (200 W)

Maximum RMS RF specified performance level

M9470A T/R port high power attenuation ON	+47 dBm (50 W) (< 30°C ambient), 30 W or 5 minutes on 5 minutes off (> 30 and < 45 °C ambient)
M9470A T/R port high power attenuation OFF	+30 dBm
M9470A RF antenna port	+23 dBm
M9472A T/R port high power attenuation ON	+53 dBm (200 W) in climate-controlled environment (< 25 °C ambient) 1 minute only

Tx post-demodulation audio filters

Low pass filter	300 Hz ¹ , 3 kHz, 15 kHz, 30 kHz, 80 kHz, 100 kHz, or 300 kHz
High pass filters	20 Hz, 50 Hz, 300 Hz, or 400 Hz ²
Band pass filters (weighted)	CCITT (ITU-T Rec. 041, ITU-T Rec. P.53), A-weighted (ANSI-IEC "A" weighted, per IEC Rec 179), C-weighted (IEEE Std 743-1995), C-message (per IEEE743), CCIR-1k weighted (CCIR Rec 468), CCIR-2k weighted (Dolby 2 K), CCIR unweighted (CCIR Rec 468)
Manual select filter	For either LPF or HPF User Defined ³

1. 2-pole Butterworth filter to match same filter in HP8920/8903/8901/8902.

2. 10-pole Butterworth filter to attenuate sub-audible signaling tones. Matching the filter on HP8920/8903/8901/8902.

3. 5-pole Butterworth filter, a general-purpose filter. The 3-dB cutoff frequency can be selected for the User-defined audio filters

Phase noise sidebands RF T/R (high power attenuation OFF) port and antenna port (CF = 1 GHz)

1 kHz offset	-110 dBc/Hz typical
10 kHz offset	-129 dBc/Hz typical
100 kHz offset	-132 dBc/Hz typical
1 MHz offset	-134 dBc/Hz typical

Spurious responses – residual response in specified frequency ranges

Frequency range	Antenna input port ranged to -70 dBm	T/R port high power attenuation OFF, ranged to -70 dBm	T/R port high power attenuation ON, ranged to 0 dBm
< 200 MHz	-95 dBm typical	-90 dBm typical	-90 dBm typical
200 MHz to 6 GHz	-95 dBm typical	-90 dBm typical	-90 dBm typical

Spurious responses – residual response in specified frequency ranges

Frequency range	M9472A T/R port high power attenuation OFF, ranged to -70 dBm	M9472A T/R port high power attenuation ON, ranged to 0 dBm
< 200 MHz	-90 dBm nominal	-90 dBm nominal
200 MHz to 6 GHz	-90 dBm nominal	-90 dBm nominal

Input related spurs (Input set to -10 dBm range)

Antenna input port	-57 dBc typical
T/R port	-65 dBc typical
M9472A T/R port high power attenuation OFF/ON	-65 dBc nominal

Displayed Average Noise Level (DANL) with analyzer ranged to -70 dBm

Frequency range	Antenna input port (dBm/Hz)	T/R port high power attenuation OFF (dBm/Hz)	T/R port high power attenuation ON (dBm/Hz)
100 kHz to 1 MHz	-146 typical	-135 typical	-117 typical
1 to 200 MHz	-157, -161 typical	-146, -149 typical	-126, -131 typical
200 to 900 MHz	-158, -161 typical	-148, -149 typical	-126, -129 typical
900 MHz to 2.1 GHz	-155, -159 typical	-143, -146 typical	-123, -127 typical
2.1 to 3.2 GHz	-154, -158 typical	-141, -144 typical	-121, -125 typical
3.2 to 4.8 GHz	-154, -157 typical	-139, -142 typical	-120, -124 typical
4.8 to 6 GHz	-151, -154 typical	-135, -138 typical	-116, -122 typical

Displayed Average Noise Level (DANL) with analyzer ranged to -70 dBm

Frequency range	M9472A T/R port high power attenuation OFF (dBm/Hz)	M9472A T/R port high power attenuation ON (dBm/Hz)
100 kHz to 1 MHz	-129 nominal	-110 nominal
1 to 200 MHz	-142 nominal	-124 nominal
200 to 900 MHz	-142 nominal	-123 nominal
900 MHz to 2.1 GHz	-140 nominal	-120 nominal
2.1 to 3.2 GHz	-137 nominal	-118 nominal
3.2 to 4.8 GHz	-136 nominal	-117 nominal
4.8 to 6 GHz	-131 nominal	-114 nominal

Input Voltage Standing Wave Ratio (VSWR) – attenuator = 0 dB

M9470A T/R port	< 1.4:1 (nominal)
Antenna port	< 1.8:1 (nominal)

IQ analyzer

Trigger	Free run, external 1, external 2, RF burst, video, periodic
Trigger delay range	-150 to 500 ms
Resolution	1/sample rate

RF generator technical specifications and characteristics

Frequency range

Option 506	100 kHz to 6 GHz
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Arb baseband bandwidth

Option BX3 (standard)	100 kHz to 60 MHz	8 MHz
	60 MHz to 220 MHz	20 MHz
	220 MHz to 380 MHz	40 MHz
	380 to 550 MHz	100 MHz
	550 to 1310 MHz	200 MHz
	1310 to 6000 MHz	300 MHz

Frequency accuracy

Same as accuracy of internal timebase or external reference input

Internal timebase accuracy ¹

$\pm [(time \text{ since last adjustment} \times \text{aging rate}) \pm \text{temperature effects} \pm \text{calibration accuracy}]$
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1. Calibration accuracy depends on how accurately the frequency standard was adjusted to 10 MHz. If the adjustment procedure is followed, the calibration accuracy is given by the specification, Achievable Initial Calibration Accuracy.

Frequency stability internal timebase

Yearly aging rate	$< \pm 0.1 \text{ ppm/year } (\pm 1 \times 10^{-7})$
Achievable initial calibration accuracy	$\pm 4 \times 10^{-8}$
Residual FM	$\leq 0.25 \text{ Hz p-p in 20 ms nominal}$

Temperature effects

20 to 30 °C	$< \pm 1.5 \times 10^{-8}$
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Amplitude level accuracy generator port ¹

Level	100 kHz to 1 MHz	1 to 90 MHz	90 MHz to 2.4 GHz	2.4 to 4.5 GHz	4.5 to 6 GHz
13 to 10 dBm	±0.65 dB typical	±1.5 dB, ±0.55 dB typical	±1.6 dB, ±0.8 dB typical	±1.6 dB, ±0.65 dB typical	±2 dB, ±1.25 dB typical
10 to -10 dBm	±0.65 dB typical	±1.8 dB, ±0.6 dB typical	±1.3 dB, ±0.45 dB typical	±1.5 dB, ±0.55 dB typical	±2 dB, ±1.1 dB typical
-10 to -70 dBm	±0.55 dB typical	±1.65 dB, ±0.65 dB typical	±1.4 dB, ±0.6 dB typical	±1.4 dB, ±0.65 dB typical	±1.8 dB, ±0.85 dB typical
-70 to -100 dBm	±0.6 dB typical	±1.6 dB, ±0.65 dB typical	±1.15 dB, ±0.35 dB typical	±1.3 dB, ±0.5 dB typical	±1.45 dB, ±0.6 dB typical
-100 to -120 dBm	±0.65 dB typical	±0.6 dB typical	±0.5 dB typical	±0.55 dB typical	±0.65 dB typical
-120 to -130 dBm	±0.8 dB nominal	±0.6 dB nominal	±0.7 dB nominal	±1.6 dB nominal	±1.5 dB nominal

1. Specifications apply when input port is set to Antenna In.

Amplitude level accuracy T/R port high power attenuation OFF ¹

Level	100 kHz to 1 MHz	1 to 90 MHz	90 MHz to 2.4 GHz	2.4 to 4.5 GHz	4.5 to 6 GHz
3 to 0 dBm	±0.65 dB typ	±1.15 dB, ±0.5 dB typ	±1.35 dB, ±0.5 dB typ	±1.7 dB, ±0.85 dB typ	±2 dB, ±1.3 dB typ
0 to -20 dBm	±0.75 dB typ	±1.3 dB, ±0.45 dB typ	±1.3 dB, ±0.45 dB typ	±1.7 dB, ±0.8 dB typ	±2 dB, ±1.15 dB typ
-20 to -70 dBm	±0.7 dB typ	±1.4 dB, ±0.65 dB typ	±1.5 dB, ±0.65 dB typ	±1.65 dB, ±0.7 dB typical	±1.65 dB, ±0.85 dB typ
-70 to -110 dBm	±0.6 dB typical	±1.45 dB, ±0.55 dB typ	±1.45 dB, ±0.6 dB typ	±1.5 dB, ±0.75 dB typ	±1.6 dB, ±0.75 dB typ
-110 to -120 dBm	±1.5 dB nom	±0.6 dB nom	±0.5 dB nom	±0.9 dB nom	±1 dB nom

1. Specifications apply when input port is set to Antenna In.

Amplitude level accuracy M9472A T/R port high power attenuation OFF ¹

Level	100 kHz to 6 GHz
-5 to -110 dBm	±1.8 dB nominal

1. Specifications apply when input port is set to Antenna In.

Amplitude level accuracy T/R port high power attenuation ON ¹

Level	100 kHz to 1 MHz	1 to 90 MHz	90 MHz to 2.4 GHz	2.4 to 4.5 GHz	4.6 to 6 GHz
-20 to -70 dBm	±0.6 dB typ	±1.6 dB, ±0.75 dB typ	±1.35 dB, ±0.5 dB typ	±1.45 dB, ±0.65 dB typ	±1.85 dB, ±0.95 dB typ
-70 to -100 dBm	±0.5 dB typ	±1.45 dB, ±0.65 dB typ	±1.4 dB, ±0.65 dB typ	±1.4 dB, ±0.6 dB typ	±1.8 dB, ±0.8 dB typ
-100 to -110 dBm	±2.3 dB nom	±0.6 dB nom	±0.4 dB nom	±0.5 dB nom	±0.7 dB nom

1. Specifications apply when input port is set to Antenna In.

Amplitude level accuracy M9472A T/R port high power attenuation ON ¹

Level	100 kHz to 6 GHz
-20 to -100 dBm	±1.3 dB nominal

1. Specifications apply when input port is set to Antenna In.

Phase noise sidebands (CF = 1 GHz)

Frequency offset	
1 kHz	-113 dBc/Hz typical
10 kHz	-130 dBc/Hz typical
100 kHz	-137 dBc/Hz typical
1 MHz	-140 dBc/Hz typical

Harmonics (T/R port and Gen port)

Frequency range	Generator port at +10 dBm (Opt. M8920B-1EA)	T/R port high power attenuation OFF at 0 dBm	T/R port high power attenuation ON at -20 dBm
100kHz to 60MHz	-34 dBc, -40 dBc nominal	-35 dBc, -40 dBc nominal	-41 dBc nominal
60 MHz to 6 GHz	-31 dBc, -36 dBc nominal	-32 dBc, -37 dBc nominal	-37 dBc nominal

Harmonics (M9472A T/R port)

Frequency range	High power attenuation OFF at -10 dBm	High power attenuation ON at -20 dBm
100kHz to 60MHz	-42 dBc nominal	-37 dBc nominal
60 MHz to 6 GHz	-39 dBc nominal	-29 dBc nominal

Non-harmonics (T/R port and Gen port)

Frequency range	Generator port at +10 dBm (Opt. M8920B-1EA)	T/R port high power attenuation OFF at 0 dBm	T/R port high power attenuation ON at -20 dBm
100kHz to 60MHz	-56 dBc nominal	-56 dBc nominal	-56 dBc nominal
60 MHz to 6 GHz	-74 dBc nominal	-73 dBc nominal	-68 dBc nominal

Non-harmonics (M9472A T/R port)

Frequency range	High power attenuation OFF at 0 dBm	High power attenuation ON at -20 dBm
100kHz to 60MHz	-52 dBc nominal	-52 dBc nominal
60 MHz to 6 GHz	-62 dBc nominal	-62 dBc nominal

Input Voltage Standing Wave Ratio (VSWR)

M9470A T/R port	< 1.6:1 (nominal)
Generator port	< 1.8:1 (nominal)

Noise floor

T/R port and generator port (-40 dBm output)	100 kHz to 60 MHz	-160 dBm/Hz typical
	60 MHz to 6 GHz	-165 dBm/Hz typical
M9472A T/R port (-40 dBm output)	100 kHz to 6 GHz	-164 dBm/Hz nominal

Generator output level range

T/R port	
100 kHz to 6 GHz (high power attenuation OFF)	-120 to +3 dBm
100 kHz to 6 GHz (high power attenuation ON)	-110 to -20 dBm, settable to –15 dBm
Generator port	
100 kHz to 6 GHz	-130 to +3 dBm
100 kHz to 6 GHz (Option M8920B-1EA)	-130 to +13 dBm, settable to +15 dBm

Generator resolution

Power	0.02 dB nominal
Frequency	0.10 Hz nominal

Generator maximum Reverse Power Protection (RPP)

Generator port	10 W for 15 sec. with alarm
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Other signaling capabilities

Signaling selection	Sine, Square, Rectangle, Triangle, Dual Sine (2-tone, CTCSS, DTMF), Ramp Up, Ramp Down, and Pulse
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Audio module technical specifications

M9260A PXI module	Audio generator performance	Audio analyzer performance
Channels	2 – Audio generator outputs	2 – Audio analyzer inputs
Built-in waveforms	Sine, Dual Sine	Sine, Dual Sine
Impedance	50 Ω and 600 Ω	50 Ω , 600 Ω , and 1 M Ω
Audio frequency range	5 Hz to 79.8 kHz	10 Hz to 80 kHz
Audio frequency resolution	363.8 μ Hz	363.8 μ Hz
Audio frequency accuracy ¹	$\pm$ (2ppm + 100 μ Hz) nominal	$\pm$ (2ppm + 100 μ Hz) nominal
Voltage range	10 μ Vp to 10 Vp	10 μ Vp to 46Vp
Amplitude resolution	1 μ V	1 μ V
Coupling	AC, DC	AC, DC
Channels per module	2 – BNC output channels	2 – BNC input channels
Max voltage amplitude	10 Vp output	46 Vp Input
AC accuracy	$\pm$ 1.0% at 1 kHz	$\pm$ 1.0% at 1 kHz
AC flatness (at 1 kHz), 5 Hz to 80 kHz BW	+/- 1% (+/-0.086 dB), all ranges	+/- 1% (+/-0.086 dB), all ranges
SINAD measurement		
Frequency range	100 Hz to 20 kHz	
Range	0 dB to 50 dB (nominal), usable up to 90 dB	
Resolution	0.1 dB	
Accuracy	$\pm$ 1 dB (nominal)	
Voltage range	1 mV to 10 V, usable up to 46V (32 Vrms)	
Distortion measurement		
Frequency range	100 Hz to 20 kHz	
Accuracy	$\pm$ 0.05% (nominal)	
Measurement Range	1% to 50% (nominal)	
Resolution	1% (nominal)	
Voltage range	1 mV to 10 V	
Hum and noise measurement		
Frequency	300 Hz to 3 kHz (nominal)	
Range	-90 dB to 0 dB (nominal)	
Resolution	0.1 dB (nominal)	
Signal to Noise Ratio (SNR) measurement ²		
Frequency	300 Hz to 3 kHz (nominal)	
Range	-80 dB to 0 dB (nominal)	
Accuracy	$\pm$ 1 dB (nominal)	

1. Stated frequency accuracy specification is achievable depending on PXI chassis 10 MHz system clock accuracy or applied external clock reference accuracy.

2. Using two-step RMS Ratio method. Refer to M8920A Measurement Guide, Measuring Rx Hum and Noise. For noisier signals, built-in SNR estimate method is not as accurate.

Audio module RX audio filters

RX audio filters

Low pass filters	3 kHz, 15 kHz, 30 kHz, 80 kHz
High pass filters	20 Hz, 50 Hz, 300 Hz, or 400 Hz
Band pass filters (weighted)	CCITT (ITU-T Rec. 041, ITU-T Rec. P.53), A-weighted (ANSI-IEC "A" weighted, per IEC Rec 179), C-message (C-Message per IEEE743), CCIR-1k weighted (CCIR Rec 468), CCIR-2k weighted (Dolby 2 K)
Manual select filter	Manual User Defined LPF filter ¹

1. The 3-dB cutoff frequency can be selected for the User-Defined audio filters.

Radio test application software specifications

N9093EM0E basic analog modulation/demodulation key specifications

Specification	Generator modulation performance	Analyzer demodulation performance
Frequency modulation		
FM deviation	100 Hz to 100 kHz (settable to 1 Hz)	Peak Dev 1 kHz to 100 kHz
FM deviation accuracy	±0.3% (nominal), 1 kHz rate, 1 kHz to 100 kHz deviation, -10 dBm output power	±0.15% (nominal), 1 kHz rate, 1 kHz to 40 kHz deviation
FM deviation resolution	1 Hz	1 Hz
FM rate (settable range)	10 Hz to 40 kHz	10 Hz to 40 kHz
Residual distortion	0.3% (nominal), 1 kHz rate, 1 kHz to 100 kHz deviation, -10 dBm output power	0.5% (nominal), 1 kHz rate, 1 kHz to 40 kHz deviation
Residual FM		0.7 Hz
Amplitude modulation		
AM depth	1% to 95%	1% to 99%
AM depth accuracy	±0.6% (nominal), 1 kHz rate, 30% to 90% depth, -10 dBm output power	±1% (nominal), 100 Hz to 10 kHz rate, 10% to 95% depth
AM depth resolution	1%	1%
AM rate (settable range)	10 Hz to 40 kHz	10 Hz to 40 kHz
Residual distortion	±0.3% (nominal), 1 kHz rate, 30% to 90% depth, -10 dBm output power	0.6% (nominal), 100 Hz to 10 kHz rate, 10% to 95% depth
Single sideband modulation (USB/LSB)		
SSB depth	1% to 90%	1% to 99%
SSB depth resolution	1%	1%
SSB rate range	10 Hz to 40 kHz	10 Hz to 40 kHz
SSB offset range		300 Hz to 3 kHz
SSB residual distortion		1.5% (nominal) depth 10% to 95%
SSB suppressed carrier (SSB-SC)	> 80 dB	
Phase modulation		
PM deviation	0.1 to 10 rad	0.2 to 10 rad
PM deviation accuracy	±0.6% (nominal), 1 kHz rate, 0.5 to 10 radians, -10 dBm output power	±0.6% (nominal), 100 Hz to 4 kHz rate, 0.2 to 10 radians

Specification	Generator modulation performance	Analyzer demodulation performance
PM resolution	0.01 rad	0.01 rad
PM rate (settable range)	10 Hz to 40 kHz	50 Hz to 4 kHz
Residual distortion	0.4% (nominal), 1 kHz rate, 0.5 to 10 radians, -10 dBm output power	1.8% (nominal) , 100 Hz to 4 kHz rate, 0.2 to 10 radians

N9093EM1E basic digital modulation/demodulation key specifications

	Generator modulation performance; Gen, T/R port (ATT OFF) at -10 dBm	Analyzer demodulation performance; Ant & T/R port (ATT OFF) at -10 dBm
EVM	±0.3% typical	±0.6% typical
Mag error	±0.2% typical	±0.5% typical
FSK error	±0.3% typical	±0.7% typical
Deviation error	±0.1% typical	±1% typical

	Generator modulation performance; M9472A T/R port (ATT OFF) at -10 dBm	Analyzer demodulation performance; M9472A T/R port (ATT OFF) at -10 dBm
EVM	±0.3% nominal	±0.4% nominal
Mag error	±0.2% nominal	±0.3% nominal
FSK error	±0.3% nominal	±0.7% nominal
Deviation error	±0.1% nominal	±1% nominal

Connectivity test application software specifications

WLAN 802.11ac (CF = 5.8 GHz)

EVM at antenna input port	-20 dBm input BW 80 MHz	-48 dB typical
	-20 dBm input BW 160 MHz	-47 dB typical
EVM at generator port	-5 to -15 dBm output BW 80 MHz	-47 dB typical
	-5 to -15 dBm output BW 160MHz	-45 dB typical

WLAN 802.11ax (CF = 5.8 GHz)

EVM at antenna input port	-20 dBm input BW 80 MHz	-48 dB typical
	-20 dBm input BW 160 MHz	-47 dB typical
EVM at generator port	-5 to -15 dBm output BW 80 MHz	-47 dB typical
	-5 to -15 dBm output BW 160MHz	-45 dB typical

WLAN 802.11be (CF = 5.8 GHz)

Loopback	-20 dBm BW 160 MHz	-46 dB nominal
	-20 dBm BW 320 MHz	-43 dB nominal

LTE-FDD/TDD (CF from 700 MHz to 2.6 GHz)

EVM at antenna input port	-10 dBm input, 20 MHz bandwidth	0.5% typical, 0.3% nominal
ACP at antenna input port	-10 dBm input, downlink	-55 dBc typical
	-10 dBm input, uplink	-57 dBc typical
Composite EVM at generator port	-10 dBm output, 20 MHz bandwidth	0.5% typical
ACP at generator port	-10 dBm output downlink/uplink	-62 dBc typical

Bluetooth®

DEVm at generator port at 0 dBm	0.8% nominal
EDR floor at antenna input port at 0 dBm input power	0.5% typical

5G NR

EVM at antenna input port	-10 dBm input, CF = 4 GHz	0.38% typical
	-10 dBm input, CF = 5 GHz	0.38% typical
	-10 dBm input, CF = 5.8 GHz	0.46% nominal
ACP at antenna input port, Noise correction OFF	-10 dBm input, CF = 4 GHz	-53 dBc typical
	-10 dBm input, CF = 5 GHz	-53 dBc typical
	-10 dBm input, CF = 5.8 GHz	-52 dBc typical
ACP at antenna input port, Noise correction ON	-10 dBm input, CF = 4 GHz	-58 dBc typical
	-10 dBm input, CF = 5 GHz	-58 dBc typical
	-10 dBm input, CF = 5.8 GHz	-55 dBc typical
EVM at generator port	-10 dBm output, CF = 4 GHz	0.35% typical
	-10 dBm output, CF = 5 GHz	0.35% typical
	-10 dBm output, CF = 5.8 GHz	0.4% nominal
ACP at generator port	-10 dBm output, CF = 4 GHz	-58 dBc typical
	-10 dBm output, CF = 5 GHz	-53 dBc typical
	-10 dBm output, CF = 5.8 GHz	-51.5 dBc nominal

General specifications

Temperature range

Operating	5 to 45 °C
Storage	-40 to 65 °C

EMC

Complies with European EMC Directive 2014/30/EU
– IEC/EN 61326-1
– CISPR Pub 11 Group 1, class A
– AS/NZS CISPR 11
– CAN ICES/NMB-001(A)
This ISM device complies with Canadian ICES001
Cet appareil ISM est conforme à la norme NMB001 du Canada

Environmental stress

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

Power requirements (M9010A 10-slot chassis)

Voltage/Frequency/Power (low-line)	100 to 120 V, 50/60/400 Hz, 735 W (nominal)
Voltage/Frequency/Power (high-line)	220 to 240 V, 50/60 Hz, 1300 W, (nominal)

Weight (M9010A 10-slot chassis with basic modules)

Net	17.5 kg (38.7 lbs), nominal
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Dimensions (M9010A 10-slot chassis)

Height	194.8 mm (with feet installed)
Width	322.5 mm
Length	552.5 mm

Warranty

The M8920B Radio Test Set is supplied with a standard one-year warranty

Calibration cycle

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

Related Literature

For more detailed product and specification information, refer to the following literature.

Publication title	Publication number
M8920B PXIe Radio Test Set Technical Overview	5992-2821EN
M8920B PXIe Radio Test Set Configuration Guide	5992-2800EN
M8920B PXIe Radio Test Set Getting Started Guide	M8920-90001
M9470A PXIe 50W Interface Module Data Sheet	5992-3140EN
M9472A PXIe 200W Interface Module Data Sheet	3124-1073EN
M9411A VXT PXIe Vector Transceiver Data Sheet	5992-1646EN
M9260A PXIe Audio Analyzer Data Sheet	5992-1918EN
KS8312xA Technical Overview for Automated Radio Testing	5992-3511EN
Keysight PXIe Chassis Family Specification Guide	M9019-90015
PC Tested Configurations with PXIe Chassis Technical Overview	5990-7632EN
Interface Modules and Adapters for PXIe Systems	5992-0377EN
M924XA InfiniiVision PXIe Modular Oscilloscopes Data Sheet	5992-2003EN
6.5 Digit PXI Digital Multimeter Data Sheet	5992-2757EN
PXIe Vector Network Analyzer Configuration Guide	5991-4885EN
89600 VSA Software Configuration Guide	5990-6386EN

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