

Product Datasheet - Technical Specifications



More information in our Web-Shop at ► www.meilhaus.com

Your contact

Technical and commercial sales, price information,
quotations, demo/test equipment, consulting:

Tel.: +49 - (0)81 41 - 52 71-0

E-Mail: sales@meilhaus.com

Meilhaus Electronic GmbH
Am Sonnenlicht 2
82239 Alling/Germany

Tel. +49 - (0)81 41 - 52 71-0 E-
Mail sales@meilhaus.com

Mentioned company and product names may be registered trademarks of the respective companies. Errors and omissions excepted. © Meilhaus Electronic.

CXA X-Series Signal Analyzer, Multi-touch N9000B

9 kHz to 3.0, 7.5, 13.6, or 26.5 GHz

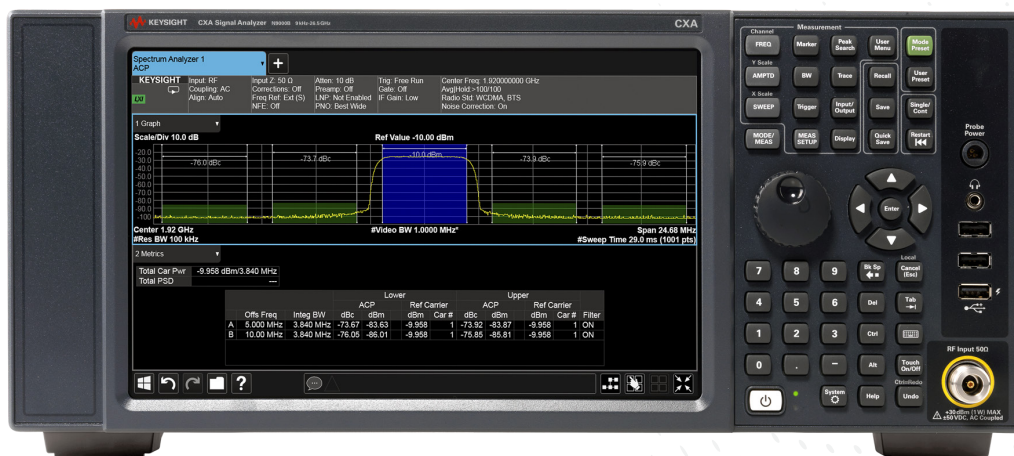


Table of Contents

| | |
|--|----|
| Definitions and Conditions | 3 |
| Frequency and Time Specifications | 4 |
| Amplitude Accuracy and Range Specifications..... | 6 |
| Dynamic Range Specifications..... | 8 |
| PowerSuite Measurement Specifications | 10 |
| Tracking Generator Specifications | 11 |
| General Specifications..... | 12 |
| Inputs and Outputs..... | 13 |
| I/Q Analyzer | 15 |
| Related Literature | 16 |

Leading low-cost tool

The CXA is today's leading low-cost tool for essential signal characterization. Its capabilities provide a solid foundation for cost-effective testing in general-purpose and educational applications.

This data sheet is a summary of the specifications and conditions for CXA signal analyzers. For the complete specifications guide, visit www.keysight.com/find/cxa_specifications

Definitions and Conditions

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

95th percentile values indicate the breadth of the population (approx. 2σ) of performance tolerances expected to be met in 95 percent of the cases with a 95 percent confidence, for any ambient temperature in the range of 20 to 30 °C. In addition to the statistical observations of a sample of instruments, these values include the effects of the uncertainties of external calibration references. These values are not warranted. These values are updated occasionally if a significant change in the statistically observed behavior of production instruments is observed.

Typical describes additional product performance information that is not covered by the product warranty. It is performance beyond specifications that 80 percent of the units exhibit with a 95 percent confidence level over the temperature range 20 to 30 °C. Typical performance does not include measurement uncertainty.

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

The analyzer will meet its specifications when:

- It is within its calibration cycle
- Under auto couple control, except when Auto Sweep Time Rules = Accy
- The analyzer has been stored at an ambient temperature within the allowed operating range for at least two hours before being turned on; if it had previously been stored at a temperature range inside the allowed storage range, but outside the allowed operating range
- The analyzer has been turned on at least 30 minutes with Auto Align set to Normal, or, if Auto Align is set to Off or Partial, alignments must have been run recently enough to prevent an Alert message. If the Alert condition is changed from “Time and Temperature” to one of the disabled duration choices, the analyzer may fail to meet specifications without informing the user. If Auto Align is set to Light, performance is not warranted, and nominal performance will degrade to become a factor of 1.4 wider for any specification subject to alignment, such as amplitude tolerances.

For ordering information, refer to the CXA Signal Analyzer Configuration Guide (5992-1275EN).

For more information

This CXA signal analyzer data sheet is a summary of the complete specifications and conditions for N9000B CXA signal analyzers, which are available in the CXA Signal Analyzer Specification Guide. The CXA Signal Analyzer Specification Guide can be obtained on the web at:

www.keysight.com/find/cxa_specifications

Frequency and Time Specifications

| Frequency range | DC coupled | AC coupled | |
|--|---|---|--------------------|
| Option 503 | NA | 9 kHz to 3.0 GHz | |
| Option 507 | NA | 9 kHz to 7.5 GHz | |
| Option 513 | 9 kHz to 13.6 GHz | 10 MHz to 13.6 GHz | |
| Option 526 | 9 kHz to 26.5 GHz | 10 MHz to 26.5 GHz | |
| | Band | LO multiple (N) | AC coupled |
| RF (Option 503, 507) | 0 | 1 | 9 kHz to 3.0 GHz |
| | 1 | 1 | 2.95 to 3.80 GHz |
| | 2 | 1 | 3.70 to 4.55 GHz |
| | 3 | 1 | 4.45 to 5.30 GHz |
| | 4 | 1 | 5.20 to 6.05 GHz |
| | 5 | 1 | 5.95 to 6.80 GHz |
| | 6 | 1 | 6.70 to 7.50 GHz |
| | Band | LO multiple (N) | AC coupled |
| MW (Option 513, 526) | 0 | 1 | 9 kHz to 3.08 GHz |
| | 1 | 2 | 2.95 to 7.58 GHz |
| | 2 | 2 | 7.45 to 9.55 GHz |
| | 3 | 2 | 9.45 to 12.60 GHz |
| | 4 | 2 | 12.50 to 13.05 GHz |
| | 4 | 4 | 12.95 to 13.80 GHz |
| | 5 | 4 | 13.40 to 15.55 GHz |
| | 6 | 4 | 15.45 to 19.35 GHz |
| | 7 | 4 | 19.25 to 21.05 GHz |
| | 8 | 4 | 20.95 to 22.85 GHz |
| | 9 | 4 | 22.75 to 24.25 GHz |
| 10 | 4 | 24.15 to 26.55 GHz | |
| Frequency reference | | | |
| Accuracy | ± [(time since last adjustment x aging rate) + temperature stability + calibration accuracy] | | |
| Aging rate | Option PFR ± 1 x 10 ⁻⁷ / year ± 1.5 x 10 ⁻⁷ / 2 years | Standard ± 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 | Option PFR ± 4 x 10 ⁻⁸ | Standard ± 1.4 x 10 ⁻⁶ | |
| Example frequency reference accuracy (with Option PFR) 1 year after last adjustment | = ± (1 x 1 x 10 ⁻⁷ + 5 x 10 ⁻⁸ + 4 x 10 ⁻⁸) = ± 1.9 x 10 ⁻⁷ | | |
| Residual FM | | | |
| Option PFR | ≤ 0.25 Hz p-p in 20 ms nominal | | |
| Standard | ≤ 10 Hz p-p in 20 ms nominal | | |
| 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 | | |

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

Frequency and Time Specifications (continued)

| Frequency span (FFT and swept mode) | | |
|--|--|------------------------------|
| Range | 0 Hz (zero span), 10 Hz to maximum frequency of instrument | |
| Resolution | 2 Hz | |
| Accuracy | | |
| Swept | ± (0.25 % x span + horizontal resolution) | |
| FFT | ± (0.10 % x span + horizontal resolution) | |
| 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 | ± 1 % nominal |
| Trigger | Free run, line, video, external 1, RF burst, periodic timer | |
| Trigger delay | Span = 0 Hz or FFT | -150 to +500 ms |
| | Span ≥ 10 Hz, swept | 1 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 40001 | |
| Resolution bandwidth (RBW) | | |
| Range (-3.01 dB bandwidth) | 1 Hz to 3 MHz (10 % steps), 4, 5, 6, 8 MHz | |
| Bandwidth accuracy (power) | 1 Hz to 750 kHz | ± 1.0 % (± 0.044 dB) nominal |
| | 820 kHz to 1.2 MHz (< 3 GHz CF) | ± 2.0 % (± 0.088 dB) nominal |
| | 1.3 to 2.0 MHz (< 3 GHz CF) | ± 0.07 dB nominal |
| | 2.2 to 3 MHz (< 3 GHz CF) | ± 0.15 dB nominal |
| | 4 to 8 MHz (< 3 GHz CF) | ± 0.25 dB nominal |
| Bandwidth accuracy (-3.01 dB) | 1 Hz to 1.3 MHz | ± 2 % nominal |
| RBW range | | |
| Selectivity (-60 dB/-3 dB) | 4.1:1 nominal | |
| EMI bandwidth (CISPR compliant) | 200 Hz, 9 kHz, 120 kHz, 1 MHz | (Option EMC required) |
| EMI bandwidth (MIL STD 461E compliant) | 10 Hz, 100 Hz, 1 kHz, 10 kHz, 100 kHz, 1 MHz | (Option EMC required) |
| Analysis bandwidth ¹ | | |
| Maximum bandwidth | Option B25 | 25 MHz |
| | Standard | 10 MHz |
| Video bandwidth (VBW) | | |
| Range | 1 Hz to 3 MHz (10 % steps), 4, 5, 6, 8 MHz, and wide open (labeled 50 MHz) | |
| Accuracy | ± 6 % nominal | |
| Measurement speed ² | | |
| Local measurement and display update rate | 11 ms (90/s) nominal | |
| Remote measurement and LAN transfer rate | 6 ms (167/s) nominal | |
| Marker peak search | 5 ms nominal | |
| Center frequency tune and transfer | 22 ms nominal | |
| Measurement/mode switching | 75 ms nominal | |

1. Analysis bandwidth is the instantaneous bandwidth available around a center frequency over which the input signal can be digitized for further analysis or processing in the time, frequency, or modulation domain.
2. Sweep points = 101.

Amplitude Accuracy and Range Specifications

| Amplitude range | | | |
|---|--|--|---|
| Measurement range | | | |
| RF (Option 503, 507) | Preamp off | 100 kHz to 1 MHz | Displayed average noise level (DANL) to +20 dBm |
| | | 1 MHz to 7.5 GHz | Displayed average noise level (DANL) to +23 dBm |
| MW (Option 513/526) | Preamp on | 100 kHz to 7.5 GHz | Displayed average noise level (DANL) to +15 dBm |
| | Preamp off | 100 kHz to 26.5 GHz | Displayed average noise level (DANL) to +23 dBm |
| | Preamp on | 100 kHz to 26.5 GHz | Displayed average noise level (DANL) to +23 dBm |
| Input attenuator range | | | |
| RF (Option 503, 507) | Standard | 0 to 50 dB in 10 dB steps | |
| | Option FSA | 0 to 50 dB in 2 dB steps | |
| MW (Option 513, 526) | Standard | 0 to 70 dB in 10 dB steps | |
| | Option FSA | 0 to 70 dB in 2 dB steps | |
| Maximum safe input level | | | |
| Average total power | | | |
| RF (Option 503, 507) | +30 dBm (1 W) | Input attenuation \geq 20 dB, preamp off | |
| | 10 dBm (10 mW) | Input attenuation \geq 20 dB, preamp on | |
| MW (Option 513, 526) | +30 dBm (1 W) | Input attenuation \geq 10 dB, preamp off | |
| | +30 dBm (1 W) | Input attenuation \geq 20 dB, preamp on | |
| Peak pulse power | | | |
| | +50 dBm (100 W) | < 10 μ s pulse width, < 1 % duty cycle, input attenuation \geq 30 dB | |
| DC volts | | | |
| RF (Option 503, 507) | AC coupled | \pm 50 Vdc | |
| MW (Option 513, 526) | AC coupled | \pm 50 Vdc | |
| | DC coupled | \pm 0.2 Vdc | |
| Display range | | | |
| Log scale | 0.1 to 1 dB/division in 0.1 dB steps | | |
| | 1 to 20 dB/division in 1 dB steps (10 display divisions) | | |
| Linear scale | 10 divisions | | |
| Scale units | dBm, dBmV, dB μ V, dBmA, dB μ A, V, W, A | | |
| Frequency response | | Specification | 95th percentile ($\approx 2\sigma$) |
| (10 dB input attenuation, 20 to 30 °C, σ = nominal standard deviation) | | | |
| RF (Option 503, 507) | 9 kHz to 10 MHz | \pm 0.60 dB | \pm 0.45 dB |
| | 10 MHz to 3 GHz | \pm 0.75 dB | \pm 0.55 dB |
| | 3 to 5.25 GHz | \pm 1.45 dB | \pm 1.00 dB |
| | 5.25 to 7.5 GHz | \pm 1.65 dB | \pm 1.20 dB |
| MW (Option 513, 526) | 9 kHz to 10 MHz | \pm 0.8 dB | \pm 0.5 dB |
| | 10 MHz to 3 GHz | \pm 0.65 dB | \pm 0.4 dB |
| | 3 to 7.5 GHz | \pm 1.5 dB | \pm 0.5 dB |
| | 7.5 to 13.6 GHz | \pm 2.0 dB | \pm 0.8 dB |
| | 13.6 to 19 GHz | \pm 2.0 dB | \pm 1.0 dB |
| | 19 to 26.5 GHz | \pm 2.5 dB | \pm 1.3 dB |
| Preamp on | | | |
| RF (Option 503, 507) (P03, P07) | 100 kHz to 3 GHz | \pm 0.70 dB | |
| | 3 to 5.25 GHz | \pm 0.85 dB | |
| | 5.25 to 7.5 GHz | \pm 1.35 dB | |
| MW (Option 513, 526) (P03, P07, P13, P26) | 100 kHz to 3 GHz | \pm 0.7 dB | |
| | 3 to 13.6 GHz | \pm 1.0 dB | |
| | 13.6 to 19 GHz | \pm 1.1 dB | |
| | 19 to 26.5 GHz | \pm 2.5 dB | |

Amplitude Accuracy and Range Specifications (continued)

| Input attenuation switching uncertainty | | Specifications | Additional information |
|--|------------------------------|----------------------------------|--|
| Attenuation > 2 dB, preamp off | 50 MHz (reference frequency) | ± 0.32 dB | ± 0.15 dB typical |
| Relative to 10 dB (reference setting) | 100 kHz to 3.0 GHz | | ± 0.30 dB nominal |
| | 3.0 to 7.5 GHz | | ± 0.50 dB nominal |
| | 7.5 to 26.5 GHz | | ± 0.70 dB nominal |
| Total absolute amplitude accuracy | | | |
| (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) | | | |
| | At 50 MHz | ± 0.40 dB | |
| | At all frequencies | ± (0.40 dB + frequency response) | |
| | 100 kHz to 10 MHz | ± 0.60 dB (95th Percentile ≈ 2σ) | |
| | 10 MHz to 2.0 GHz | ± 0.50 dB (95th Percentile ≈ 2σ) | |
| | 2.0 to 3.0 GHz | ± 0.60 dB (95th Percentile ≈ 2σ) | |
| Preamp on (Option P03/P07/P13/P26) | | | ± (0.39 dB + frequency response) nominal |
| Input voltage standing wave ratio (VSWR) (≥ 10 dB attenuation) | | | |
| | | Option 503, 507 | Option 513, 526 |
| | 10 MHz to 3 GHz | < 1.5 nominal | < 1.3 nominal |
| | 3 to 7.5 GHz | < 2.0 nominal | < 1.4 nominal |
| | 7.5 to 26.5 GHz | N/A | < 1.9 nominal |
| Resolution bandwidth switching uncertainty (referenced to 30 kHz RBW) | | | |
| | 1 Hz to 3 MHz RBW | ± 0.15 dB | |
| | 4, 5, 6, 8 MHz RBW | ± 1.0 dB | |
| Reference level | | | |
| Range | | | |
| Log scale | | -170 to +23 dBm in 0.01 dB steps | |
| Linear scale | | Same as log (707 pV to 3.16 V) | |
| Accuracy | | 0 dB | |
| Display scale switching uncertainty | | | |
| Switching between linear and log | | 0 dB | |
| Log scale/div switching | | 0 dB | |
| Display scale fidelity | | | |
| -80 dBm ≤ input mixer level < -15 dBm | | ± 0.15 dB total | |
| -15 dBm ≤ input mixer level < -10 dBm | | ± 0.30 dB | ± 0.15 dB typical |
| Trace detectors | | | |
| Normal, peak, sample, negative peak, log power average, RMS average, and voltage average | | | |
| Preamplifier (Option P03/P07/P13/P26) | | | |
| Frequency range | Option P03 | 100 kHz to 3.0 GHz | |
| | Option P07 | 100 kHz to 7.5 GHz | |
| | Option P13 | 100 kHz to 13.6 GHz | |
| | Option P26 | 100 kHz to 26.5 GHz | |
| Gain | 100 kHz to 26.5 GHz | +20 dB nominal | |
| Noise figure | 100 kHz to 26.5 GHz | DANL + 176.24 dB nominal | |

Dynamic Range Specifications

| | 1 dB gain compression (two-tone) | | Total power at input mixer |
|----------------------|----------------------------------|--------------------|----------------------------|
| RF (Option 503, 507) | Preamp off | 50 MHz to 7.5 GHz | +2 dBm nominal |
| | Preamp on | 50 MHz to 7.5 GHz | -19 dBm nominal |
| MW (Option 513/526) | Preamp off | 50 MHz to 7.5 GHz | +7 dBm nominal |
| | | 7.5 to 13.6 GHz | +3 dBm nominal |
| | | 13.6 to 26.5 GHz | +0 dBm nominal |
| | Preamp on | 50 MHz to 26.5 GHz | -19 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)

Parentheses indicate typical performance

Preamplifier OFF

Preamplifier ON

| | | | |
|---------------------|-------------------|-----------------|------------------------------|
| RF (Option 503/507) | 9 kHz to 1 MHz | (-120) dBm | (-139) dBm, 100 kHz to 1 MHz |
| | 1 to 10 MHz | -130 (-137) dBm | -149 (-157) dBm |
| | 10 MHz to 1.5 GHz | -148 (-150) dBm | -161 (-163) dBm |
| | 1.5 to 2.2 GHz | -144 (-147) dBm | -160 (-163) dBm |
| | 2.2 to 2.5 GHz | -144 (-147) dBm | -158 (-161) dBm |
| | 2.5 to 2.7 GHz | -142 (-145) dBm | -158 (-161) dBm |
| | 2.7 to 3.0 GHz | -139 (-143) dBm | -158 (-161) dBm |
| | 3 to 4.5 GHz | -137 (-140) dBm | -155 (-159) dBm |
| | 4.5 to 6 GHz | -133 (-136) dBm | -152 (-156) dBm |
| | 6 to 7.5 GHz | -128 (-131) dBm | -148 (-152) dBm |
| MW (Option 513/526) | 1 to 10 MHz | -143 (-148) dBm | -153 (-158) dBm |
| | 10 MHz to 1.5 GHz | -147 (-150) dBm | -160 (-163) dBm |
| | 1.5 to 6 GHz | -143 (-147) dBm | -158 (-161) dBm |
| | 6 to 7.5 GHz | -141 (-145) dBm | -155 (-160) dBm |
| | 7.5 to 13.6 GHz | -139 (-142) dBm | -155 (-160) dBm |
| | 13.6 to 20 GHz | -134 (-140) dBm | -153 (-157) dBm |
| | 20 to 24 GHz | -132 (-138) dBm | -151 (-155) dBm |
| | 24 to 26.5 GHz | -124 (-129) dBm | -142 (-147) dBm |

Spurious responses

| | | | | |
|----------------------|--|---------------------------------------|------------------|-----------------|
| RF (Option 503, 507) | Residual responses | 200 kHz to 7.5 GHz (swept) | -90 dBm | |
| | (Input terminated and 0 dB attenuation, 20 to 30 °C) | Zero span or FFT or other frequencies | -100 dBm nominal | |
| | Input related spurious | 10 MHz to 7.5 GHz | -60 dBc typical | |
| MW (Option 513, 526) | | Tuned frequency (f) | Mixer level | Response |
| | Image responses | 10 MHz to 26.5 GHz | -10 dBm | -60 dBc typical |
| | LO-related spurious | 10 MHz to 3 GHz | -10 dBm | -64 dBc typical |
| | Other spurious responses | | | |
| | First RF order (f ≥ 10 MHz from carrier) | | -10 dBm | -65 dBc |
| | High RF order (f ≥ 10 MHz from carrier) | | -30 dBm | -65 dBc |

Second harmonic distortion (SHI)

| | Source frequency | SHI (nominal) |
|-----------------------------------|--------------------|---------------|
| RF/MW (Option 503, 507, 513, 526) | 10 MHz to 3.75 GHz | +42 dBm |
| MW (Option 513, 526) | 3.75 to 13.25 GHz | +54 dBm |

Dynamic Range Specifications (continued)

Third-order intermodulation distortion (TOI)

Parentheses indicate typical performance

| | | | |
|----------------------------|--|--------------------|--------------------|
| RF (Option 503, 507) | Preamp off (Two -20 dBm tones at input mixer spaced by 100 kHz, 0 dB attenuation, 20 to 30 °C) | 10 to 400 MHz | +10 (+14) dBm |
| | | 400 MHz to 3 GHz | +13 (+17) dBm |
| | | 3 to 7.5 GHz | +13 (+15) dBm |
| MW (Option 513/526) | Preamp off (Two -20 dBm tones at input mixer spaced by 100 kHz, 0 dB attenuation, 20 to 30 °C) | 10 to 500 MHz | +11 dBm, (+15) dBm |
| | | 500 MHz to 2 GHz | +12 dBm, (+15) dBm |
| | | 2 to 3 GHz | +11 dBm, (+15) dBm |
| | | 3 to 7.5 GHz | +12 dBm, (+17) dBm |
| | | 7.5 to 13.6 GHz | +11 dBm, (+15) dBm |
| Option P03/P07/P13/ P26 | Preamp on (Two -45 dBm tones at the preamp input, spaced by 100 kHz, 0 dB attenuation, 20 to 30 °C) | 13.6 to 26.5 GHz | +10 dBm, (+14) dBm |
| | | 10 MHz to 26.5 GHz | -8 dBm nominal |

| Phase noise | Offset | Specification | Typical |
|--|---------|---------------|---------------------|
| Noise sidebands (20 to 30 °C, CF = 1 GHz) | | | |
| | 1 kHz | -98 dBc/Hz | -103 dBc/Hz |
| | 10 kHz | -106 dBc/Hz | -110 dBc/Hz |
| | 100 kHz | -108 dBc/Hz | -110 dBc/Hz |
| | 1 MHz | -130 dBc/Hz | -130 dBc/Hz |
| | 10 MHz | | -145 dBc/Hz nominal |

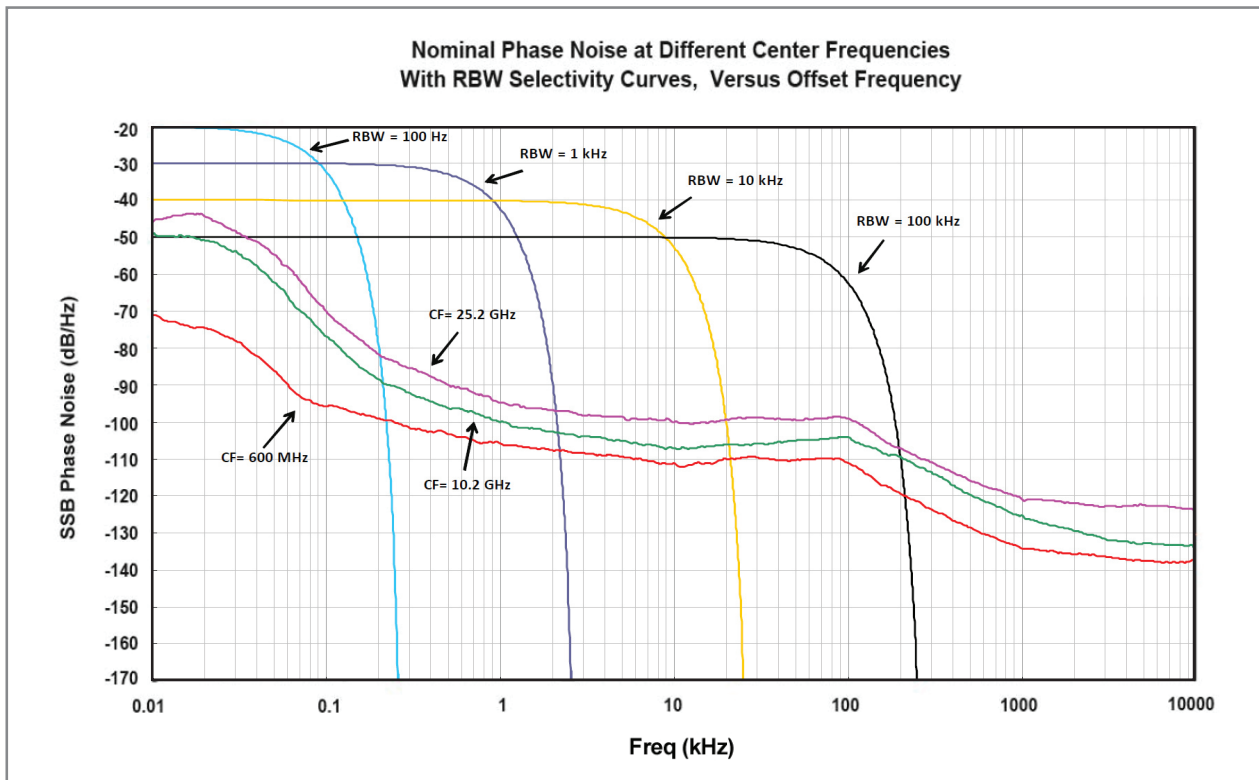


Figure 1. Nominal phase noise at different center frequencies for CXA

PowerSuite Measurement Specifications

| Channel power | | | |
|---|--------------------------|---|-----------|
| Amplitude accuracy, W-CDMA or IS95 (20 to 30 °C, attenuation = 10 dB) | | ± 1.33 dB (± 0.61 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 | | ± 0.76 dB | ± 0.73 dB |
| BTS | | ± 1.72 dB | ± 1.96 dB |
| Dynamic range (typical) | | | |
| RF (Option 503, 507) | Without noise correction | -63 dB | -67 dB |
| | With noise correction | -73 dB | -78 dB |
| MW (Option 513, 526) | Without noise correction | -66 dB | -69 dB |
| | With noise correction | -73 dB | -78 dB |
| Offset channel pairs measured | | 1 to 6 | |
| Power statistics CCDF | | | |
| Histogram resolution | | 0.01 dB | |
| Harmonic distortion | | | |
| Maximum harmonic number | | 10th | |
| Results | | 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 power, maximum power, minimum power within burst, burst width | |
| Spurious emission | | | |
| W-CDMA (1 to 2.7 GHz) table-driven spurious signals; search across regions | | | |
| Dynamic range (RBW=1 MHz) | 70.7 dB | (75.9 dB typical) | |
| Absolute sensitivity (RBW=1 MHz) | -76.5 dBm | (-82.5 dBm typical) | |
| Spectrum emission mask (SEM) | | | |
| cdma2000® (750 kHz offset) | | | |
| Relative dynamic range (30 kHz RBW) | 67.4 dB | (72.7 dB typical) | |
| Absolute sensitivity | -93.7 dBm | (-99.7 dBm typical) | |
| Relative accuracy | ± 0.11 dB | | |
| 3GPP W-CDMA (2.515 MHz offset) | | | |
| Relative dynamic range (30 kHz RBW) | 73.4 dB | (80.2 dB typical) | |
| Absolute sensitivity | -91.7 dBm | (-97.7 dBm typical) | |
| Relative accuracy | ± 0.11 dB | | |

Tracking Generator Specifications

| Output frequency | | |
|---|--|---------------------------------------|
| Frequency range | | |
| Option T03 ¹ | 9 kHz to 3 GHz | |
| Option T06 ¹ | 9 kHz to 6 GHz | |
| Resolution | 1 Hz | |
| Output power level | | |
| Range | -50 to 0 dBm | |
| Resolution | 0.1 dB | |
| Absolute accuracy (at 50 MHz, -10 dBm, 20 to 30 °C) | ± 0.55 dB | |
| Output flatness (referenced to 50 MHz, -10 dBm, 20 to 30 °C) | Specification | 95th percentile ($\approx 2\sigma$) |
| 9 kHz to 100 kHz | ± 1.5 dB | ± 1.2 dB |
| 100 kHz to 3.0 GHz | ± 1.2 dB | ± 0.8 dB |
| 3.0 GHz to 6.0 GHz | ± 1.5 dB | ± 1.2 dB |
| Level accuracy | | |
| 9 kHz to 100 kHz | | ± 1.0 dB nominal |
| 100 kHz to 3.0 GHz | | ± 0.5 dB nominal |
| 3.0 GHz to 6.0 GHz | | ± 0.8 dB nominal |
| Output power sweep | | |
| Range | -50 to 0 dBm | |
| Resolution | 0.1 dB | |
| Maximum safe reverse level | | |
| Average total power | +30 dBm (1 W) | |
| AC coupled | ± 50 Vdc | |
| Phase noise | | |
| Noise sidebands (CF = 1 GHz) | Offset | |
| | 10 kHz | -102 dBc/Hz nominal |
| | 100 kHz | -104 dBc/Hz nominal |
| | 1 MHz | -117 dBc/Hz nominal |
| Spurious outputs (0 dBm output) | | |
| Harmonic spurs | | |
| 100 kHz to 3 GHz | < -35 dBc | |
| 3 GHz to 6 GHz | < -30 dBc | |
| Non-harmonic spurs | | |
| 9 kHz to 10 MHz | | < -35 dBc nominal |
| 10 MHz to 6 GHz | < -35 dBc | |
| Dynamic range | | |
| | Maximum output power – displayed average noise level | 110 dBc nominal |
| Output VSWR | | |
| 9 kHz to 6 GHz | < 1.5:1 nominal | |

1. Not available on microwave CXA (Option 513 or 526).

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 61326-1 or IEC/EN 61326-2-1
- CISPR Pub 11 Group 1, class A
- AS/NZS CISPR 11:2002
- ICES/NMB-001

This ISM device complies with Canadian ICES-001

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

Safety

Complies with European Low Voltage Directive 73/23/EEC, amended by 93/68/EEC

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

Audio noise

| | |
|-------------------------|---------------------|
| 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 MILPRF-28800F Class 3.

Power requirements

| | | |
|---------------------------------|--|--|
| Voltage and frequency (nominal) | 100/120 V, 50/60/400 Hz 220/240 V, 50/60 Hz | The instruments can operate with mains supply voltage fluctuations up to $\pm 10\%$ of the nominal voltage |
| Power consumption | | |
| On | 270 W maximum | |
| Standby | 20 W | |

Display

| | |
|------------|--------------------------------------|
| Resolution | 1280 x 768, WXGA |
| Size | 269 mm (10.6 in.) diagonal (nominal) |

Data storage

| | |
|----------|--|
| Internal | 160 GB nominal (removable solid state drive) |
| External | Supports USB 2.0 compatible memory devices |

Weight (without options)

| | |
|----------|--------------------|
| Net | 15.4 kg (34.0 lbs) |
| Shipping | 27.4 kg (60.4 lbs) |

Dimensions

| | |
|--------|------------------|
| Height | 177 mm (7.0 in) |
| Width | 426 mm (16.8 in) |
| Length | 368 mm (14.5 in) |

Warranty

The CXA signal analyzer is supplied with a 3-year warranty

Calibration cycle

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

Inputs and Outputs

Front panel

| | |
|-------------------------------------|---|
| RF input | |
| Connector | Type-N female, 50 Ω nominal |
| RF output (Option T03 or T06) | |
| Connector | Type-N female, 50 Ω nominal |
| Probe power | |
| Voltage/current | +15 Vdc, $\pm 7\%$ at 150 mA max. nominal -12.6 Vdc, $\pm 10\%$ 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) |
| Port not marked with lightning bolt | 0.5 A |

Rear panel

| | |
|-----------------------------------|--|
| 10 MHz out | |
| Connector | BNC female, 50 Ω nominal |
| Output amplitude | ≥ 0 dBm nominal |
| Frequency | 10 MHz \pm (10 MHz x frequency reference accuracy) |
| Ext Ref In | |
| Connector | BNC female, 50 Ω nominal |
| Input amplitude range | -5 to 10 dBm nominal |
| Input frequency | 10 MHz \pm nominal |
| Frequency lock range | $\pm 5 \times 10^{-6}$ of specified external reference input frequency |
| Trigger 1 input | |
| Connector | BNC female |
| Impedance | > 10 k Ω nominal |
| Trigger level range | -5 to 5 V |
| Trigger 1 output | |
| Connector | BNC female |
| Impedance | 50 Ω nominal |
| Level | 5 V TTL nominal |
| Monitor output | |
| Connector | VGA compatible, 15-pin mini D-SUB |
| Format | XGA (60 Hz vertical sync rates, non-interlaced) Analog RGB |
| Resolution | 1024 x 768 |
| Noise source drive +28 V (pulsed) | |
| Connector | BNC female |
| SNS Series noise source | |
| Analog out | |
| Connector | BNC female |

Inputs and Outputs (continued)

| | |
|---|--|
| USB ports | |
| Host, super speed | 2 ports (stacked with each other) |
| Standard | Compatible with USB 3.0 |
| Connector | USB Type-A female |
| Output current | 0.9 A |
| Host | 1 port (stacked with LAN) |
| Standard | USB 2.0 |
| Connector | USB Type-A female |
| Output current | 0.5 A |
| Device | |
| Standard | Compatible with USB 3.0 |
| Connector | USB Type-B female |
| 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 |
| Rear panel (continued) | |
| LAN TCP/IP interface | |
| Standard | 1000Base-T |
| Connector | RJ45 Ethertwist |
| Sync (reserved for future use) | |
| Connector | BNC female |
| IF output | |
| Connector | SMA female |
| Impedance | 50 Ω nominal |
| Wideband IF output, Option CR3¹ | |
| Center frequency | |
| SA mode or I/Q analyzer | 322.5 MHz |
| Conversion gain | |
| | -4 to +7 dB (nominal) plus RF frequency response |
| Bandwidth | |
| Low band | Up to 120 MHz (nominal) |
| High band | Up to 40 MHz (nominal) |

1. Not available on microwave CXA (Option 513 or 526).

I/Q Analyzer

Frequency

| | |
|---------------------|-----------------|
| Frequency span | |
| Standard instrument | 10 Hz to 10 MHz |
| Option B25 | 10 Hz to 25 MHz |

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 instrument | 10 Hz to 10 MHz |
| Option B25 | 10 Hz to 25 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) | Max. error | RMS (nominal) |
|------------------------|------------|------------|---------------|
| ≤ 3.0 | ≤ 10 | ± 0.40 dB | 0.03 dB |
| 3.0 < f ≤ 26.5 | ≤ 10 | ± 0.40 dB | 0.25 dB |

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

| Center frequency (GHz) | Span (MHz) | Peak-to-peak | RMS |
|------------------------|------------|--------------|-------|
| ≤ 3.0 | ≤ 10 | 0.5 ° | 0.2 ° |
| 3.0 < f ≤ 7.5 | ≤ 10 | 2.7 ° | 2.4 ° |
| 7.5 < f ≤ 26.5 | ≤ 10 | 1.5 ° | 0.4 ° |

Data acquisition (standard 10 MHz IF path)

| | |
|--------------------|---------------------------|
| Time record length | 4,000,000 IQ sample pairs |
| Sample rate | 30 MSa/s |
| ADC resolution | 14 Bits |

Option B25 25 MHz analysis bandwidth

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

| Center frequency (GHz) | Span (MHz) | Max. error | RMS (nominal) |
|------------------------|------------|------------|---------------|
| ≤ 3.0 | 10 to ≤ 25 | ± 0.45 dB | 0.03 dB |
| 3.0 < f ≤ 26.5 | 10 to ≤ 25 | ± 0.45 dB | 0.65 dB |

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

| Center frequency (GHz) | Span (MHz) | Peak-to-peak | RMS |
|------------------------|------------|--------------|-------|
| 0.02 ≤ f ≤ 3.0 | 10 to ≤ 25 | 2.7 ° | 0.9 ° |
| 3.0 < f ≤ 7.5 | 10 to ≤ 25 | 4.7 ° | 2.2 ° |
| 7.5 < f ≤ 26.5 | 10 to ≤ 25 | 3.5 ° | 1.0 ° |

Data acquisition (B25 IF path)

| | |
|--------------------|---------------------------|
| Time record length | |
| IQ analyzer | 4,000,000 IQ sample pairs |
| Sample rate | 90 MSa/s |
| ADC resolution | 14 Bits |

Related Literature

| Literature | Pub number |
|--|-------------|
| CXA Signal Analyzer N9000B - Configuration Guide | 5992-1275EN |
| X-Series Signal Analyzers - Brochure | 5992-1316EN |

For more information or literature resources please visit the web:

www.keysight.com/find/cxa

Web

Product page:

www.keysight.com/find/N9000B

X-Series measurement applications:

www.keysight.com/find/X-Series_Apps

X-Series signal analyzers:

www.keysight.com/find/X-Series

cdma2000 is a US registered certification mark of the Telecommunications Industry Association.