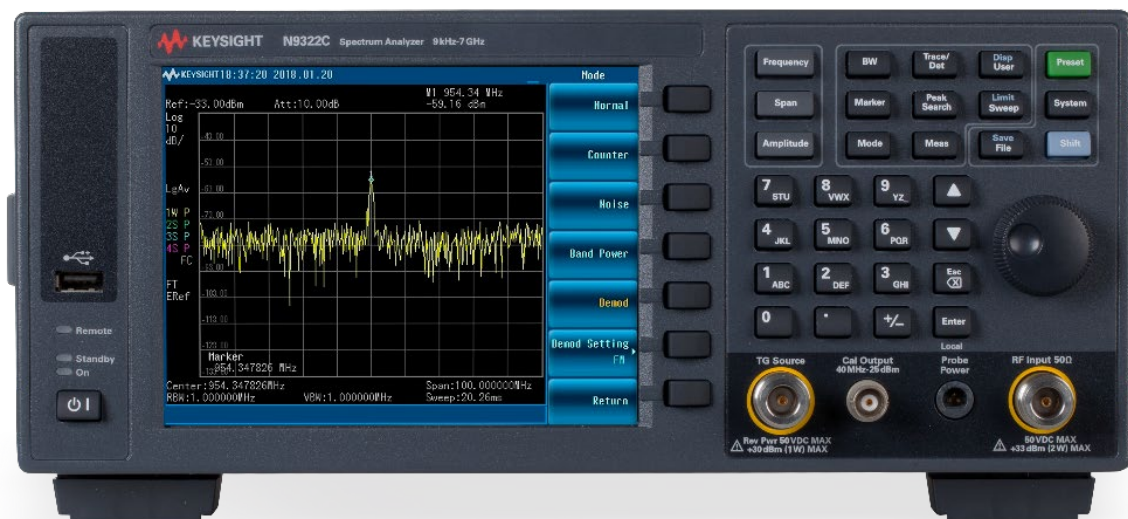


# BSA Spectrum Analyzer

N9322C: 9 kHz to 7 GHz



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**KEYSIGHT**  
Authorized Premium  
Distributor

Mess- und Prüftechnik. Die Experten.

# Definitions and Conditions

## Specification

Describes the performance of parameters covered by the product warranty and apply to the full temperature range of 5 to 45°C, unless otherwise noted.

## 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

Indicates 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
- It has been turned on at least 30 minutes
- It 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

# Frequency and Time Specification

| Frequency                                                |                                                                                                                                      | Supplemental information                                                                            |
|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| Range                                                    | 9 kHz to 7 GHz                                                                                                                       | AC coupled                                                                                          |
| Resolution                                               | 1 Hz                                                                                                                                 |                                                                                                     |
| Frequency reference                                      |                                                                                                                                      |                                                                                                     |
|                                                          | Option PFR                                                                                                                           | Standard                                                                                            |
| Nominal frequency                                        | 10 MHz                                                                                                                               | 10 MHz                                                                                              |
| Aging rate                                               | $\pm 1 \times 10^{-7}$ /Year                                                                                                         | $\pm 1 \times 10^{-6}$ /Year                                                                        |
| Temperature stability                                    |                                                                                                                                      |                                                                                                     |
| 20 to 30°C                                               | $\pm 1.5 \times 10^{-8}$                                                                                                             |                                                                                                     |
| 5 to 45°C                                                | $\pm 5 \times 10^{-8}$                                                                                                               | $\pm 1 \times 10^{-6}$                                                                              |
| Achievable initial calibration accuracy                  | $\pm 4 \times 10^{-8}$                                                                                                               | $\pm 1 \times 10^{-6}$                                                                              |
| Frequency readout accuracy (start, stop, center, marker) |                                                                                                                                      |                                                                                                     |
| Marker resolution                                        | (frequency span)/(number of sweep point – 1)                                                                                         |                                                                                                     |
| Uncertainty                                              | $\pm$ (freq indication x freq reference uncertainty <sup>1</sup> + 1% x span +20% x resolution bandwidth + marker resolution + 1 Hz) |                                                                                                     |
| Sweep point                                              | 461, fixed                                                                                                                           |                                                                                                     |
| Marker frequency counter                                 |                                                                                                                                      |                                                                                                     |
| Resolution                                               | 1 Hz                                                                                                                                 |                                                                                                     |
| Accuracy                                                 | $\pm$ [(marker freq x freq reference uncertainty <sup>1</sup> ) + (counter resolution)]                                              | RBW/Span $\geq$ 0.02<br>(Marker level to displayed noise level<br>> 25 dB, frequency offset = 0 Hz) |
| Frequency span (FFT and swept mode)                      |                                                                                                                                      |                                                                                                     |
| Range                                                    | 0 Hz (zero span), 50 Hz to 7 GHz                                                                                                     |                                                                                                     |
| Resolution                                               | 1 Hz                                                                                                                                 |                                                                                                     |
| Accuracy                                                 | $\pm$ (0.22% xspan + span/(sweep point –1)), nominal                                                                                 |                                                                                                     |
| Sweep time and triggering                                |                                                                                                                                      |                                                                                                     |
| Range                                                    | 2 ms to 1000 s                                                                                                                       | Span $\geq$ 100 Hz                                                                                  |
|                                                          | 600 ns to 1000 s                                                                                                                     | Span = 0 Hz (minimum resolution = 600 ns, when RBW $\geq$ 30 kHz)                                   |
| Mode                                                     | Continuous, Single                                                                                                                   |                                                                                                     |
| Sweep time rule                                          | Accuracy or Speed                                                                                                                    |                                                                                                     |
| Trigger                                                  | Free run, video, external, RF burst                                                                                                  | Requires option TMG to enable RF burst trigger                                                      |
| Trigger slope                                            | Selectable positive or negative edge                                                                                                 |                                                                                                     |
| Trigger delay                                            | $\pm$ 12 ms to $\pm$ 12 s, nominal                                                                                                   | Span = 0 Hz                                                                                         |
| Time-gated sweep (Option TMG)                            |                                                                                                                                      |                                                                                                     |
| Gate sources                                             | External                                                                                                                             |                                                                                                     |
|                                                          | Periodic timer                                                                                                                       | Sync sources include free and external                                                              |
|                                                          |                                                                                                                                      | Period 0 to 20 s (It should be gerater than gate delay plus gate length)                            |
| Gate delay range                                         | 12 $\mu$ s to 10 s                                                                                                                   | Offset –5 to +5 s                                                                                   |
| Gate length range                                        | 84 $\mu$ s to 10 s                                                                                                                   | Resolution = 200 ns                                                                                 |
| RBW range                                                | $\geq$ 1 kHz                                                                                                                         | Resolution = 200 ns                                                                                 |
|                                                          |                                                                                                                                      | VBW is fixed and equal to RBW for efficiency                                                        |
| Resolution bandwidth (RBW)                               |                                                                                                                                      |                                                                                                     |
| Range (–3 dB bandwidth)                                  | 10 Hz to 3 MHz                                                                                                                       | In 1-3-10 sequence                                                                                  |
| Accuracy                                                 | $\pm$ 5%, nominal                                                                                                                    | < 10% when RBW = 3 MHz                                                                              |
| Resolution filter shape factor                           | < 5 : 1, nominal                                                                                                                     | 60 dB/3 dB bandwidth ratio, digital, Gaussian-like                                                  |
| EMI bandwidth (CISPR compliant)                          | 200 Hz, 9 kHz, 120 kHz, 1 MHz                                                                                                        | Option EMC required                                                                                 |
| Accuracy                                                 | $\pm$ 10% nominal                                                                                                                    |                                                                                                     |
| Resolution filter shape factor                           | < 5:1 nominal                                                                                                                        | –60 dB/–6 dB bandwidth ratio                                                                        |
| Video bandwidth (VBW)                                    |                                                                                                                                      |                                                                                                     |
| Range                                                    | 1 Hz to 3 MHz in 1-3-10 sequence                                                                                                     | In 1-3-10 sequence                                                                                  |
| Accuracy                                                 | $\pm$ 10%. nominal                                                                                                                   | VBW = 1 Hz to 1 MHz                                                                                 |

1. Frequency reference uncertainty = Aging rate x period since adjustment + temperature stability + calibration accuracy.

# Amplitude Specification

| Measurement range                                                                                                                                                                                            |                                                                                                               | Supplemental information              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|---------------------------------------|
| 100 kHz to 1 MHz                                                                                                                                                                                             | Displayed average noise level (DANL) to +10 dBm                                                               | Preamp off                            |
| 1 MHz to 7 GHz                                                                                                                                                                                               | Displayed average noise level (DANL) to +20 dBm                                                               |                                       |
| Input attenuator range                                                                                                                                                                                       | 0 to 50 dB, in 1 dB steps                                                                                     |                                       |
| Maximum damage level                                                                                                                                                                                         |                                                                                                               |                                       |
| Average continuous power                                                                                                                                                                                     | ≤ +33 dBm, 3 minutes maximum                                                                                  | Input attenuator setting ≥ 20 dB      |
| DC voltage                                                                                                                                                                                                   | ± 50 V <sub>DC</sub> maximum                                                                                  | 2 MHz to 7 GHz                        |
| Level display range                                                                                                                                                                                          |                                                                                                               |                                       |
| Scale units                                                                                                                                                                                                  | dBm, dBmV, dBμV, dBmV EMF, dBμV EMV, V, W, V EMF                                                              |                                       |
| Marker level readout                                                                                                                                                                                         | 0.01 dB                                                                                                       | Log scale                             |
| Resolution                                                                                                                                                                                                   | < 1% of signal level                                                                                          | Linear scale                          |
| Number of traces                                                                                                                                                                                             | 4                                                                                                             |                                       |
| Detectors                                                                                                                                                                                                    | Positive-peak, negative-peak, sample, normal, average (video, RMS, voltage), quasi-peak (option EMC required) |                                       |
| Trace function                                                                                                                                                                                               | Clear/write, maximum hold, average, minimum hold                                                              |                                       |
| Frequency response                                                                                                                                                                                           |                                                                                                               |                                       |
| 20 to 30°C, 30% to 70% relative humidity, attenuation 20 dB, reference frequency 50 MHz                                                                                                                      |                                                                                                               |                                       |
| 9 to 100 kHz                                                                                                                                                                                                 | ± 0.5 dB nominal                                                                                              | Preamp off                            |
| 100 kHz to 3 GHz                                                                                                                                                                                             | ± 0.7 dB                                                                                                      | Preamp off                            |
| 3 to 4 GHz                                                                                                                                                                                                   | ± 0.85 dB                                                                                                     | Preamp off                            |
| 4 to 7 GHz                                                                                                                                                                                                   | ± 1.0 dB                                                                                                      | Preamp off                            |
| 100 kHz to 3 GHz                                                                                                                                                                                             | ± 0.7 dB                                                                                                      | Preamp on                             |
| 3 to 4 GHz                                                                                                                                                                                                   | ± 0.9 dB                                                                                                      | Preamp on                             |
| 4 to 7 GHz                                                                                                                                                                                                   | ± 1.1 dB                                                                                                      | Preamp on                             |
| Input attenuation switching uncertainty at 50 MHz                                                                                                                                                            |                                                                                                               |                                       |
| 20 to 30°C, attenuation ≥ 1 dB, preamp off                                                                                                                                                                   |                                                                                                               |                                       |
| 1 to 50 dB attenuation                                                                                                                                                                                       | Typical ± 0.2 dB                                                                                              | Relative to 20 dB (reference setting) |
| Resolution bandwidth switching uncertainty                                                                                                                                                                   |                                                                                                               |                                       |
| 20 to 30°C, 10 Hz to 3 MHz RBW                                                                                                                                                                               | ± 0.1 dB, nominal                                                                                             |                                       |
| Total absolute amplitude accuracy                                                                                                                                                                            |                                                                                                               |                                       |
| 20 to 30°C, 30% to 70% RH, peak detector, RBW 1 kHz, VBW 300 Hz, sweep time Accuracy, input signal -50 to 0 dBm, preamp off; attenuation 20 dB. Add additional ± 0.3 dB when sweep time rule is set to Speed |                                                                                                               |                                       |
| At 50 MHz                                                                                                                                                                                                    | ± 0.3 dB                                                                                                      |                                       |
| At all frequencies                                                                                                                                                                                           | ± (0.3 dB + frequency response)                                                                               |                                       |
| 100 kHz to 3 GHz                                                                                                                                                                                             | ± 0.60 dB                                                                                                     | 95th percentile                       |
| 3 to 4 GHz                                                                                                                                                                                                   | ± 0.65 dB                                                                                                     | 95th percentile                       |
| 4 to 7 GHz                                                                                                                                                                                                   | ± 0.80 dB                                                                                                     | 95th percentile                       |
| Preamp on                                                                                                                                                                                                    |                                                                                                               |                                       |
| At 50 MHz                                                                                                                                                                                                    | ± 0.4 dB                                                                                                      |                                       |
| At all frequencies                                                                                                                                                                                           | ± (0.4 dB + frequency response)                                                                               |                                       |
| 100 kHz to 3 GHz                                                                                                                                                                                             | ± 0.60 dB                                                                                                     | 95th percentile                       |
| 3 to 4 GHz                                                                                                                                                                                                   | ± 0.65 dB                                                                                                     | 95th percentile                       |
| 4 to 7 GHz                                                                                                                                                                                                   | ± 0.90 dB                                                                                                     | 95th percentile                       |
| Preamplifier                                                                                                                                                                                                 |                                                                                                               |                                       |
| Frequency                                                                                                                                                                                                    | 9 kHz to 7 GHz                                                                                                |                                       |
| Gain                                                                                                                                                                                                         | 25 dB, nominal (100 kHz to 7 GHz)                                                                             |                                       |
|                                                                                                                                                                                                              | 15 dB, nominal (9 to 100 kHz)                                                                                 |                                       |

# Dynamic Range Specifications

| 1 dB gain compression                                                                                                          |                                                     |                                                       | Supplemental information                                                            |
|--------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------------------------|
| 20 to 30°C, frequency ≥ 50 MHz, Ref level > -20 dBm                                                                            |                                                     |                                                       |                                                                                     |
| Preamp off                                                                                                                     | 50 to 200 MHz<br>200 to 500 MHz<br>500 MHz to 7 GHz | + 2 dBm nominal<br>+ 4 dBm nominal<br>+ 7 dBm nominal | Mixer power level (dBm) = input power (dBm) – input attenuation (dB)                |
| Preamp on                                                                                                                      | > -32 dBm nominal; total power at the preamp        |                                                       | Total power at the preamp = total power at the input (dBm) – input attenuation (dB) |
| Displayed average noise level (DANL)                                                                                           |                                                     | Normalized to 1 Hz                                    | With 10 Hz RBW                                                                      |
| 20 to 30°C, input terminated 50 Ω, 0 dB input attenuation, RBW = 1 kHz, RMS detector, average ≥ 40                             |                                                     |                                                       |                                                                                     |
| Preamp off                                                                                                                     | 9 to 100 kHz                                        | -100 dBm, nominal                                     | -90 dBm, nominal                                                                    |
|                                                                                                                                | 100 kHz to 1 MHz                                    | -108 dBm, -127 dBm typical                            | -98 dBm, -117 dBm typical                                                           |
|                                                                                                                                | 1 to 10 MHz                                         | -128 dBm, -146 dBm typical                            | -118 dBm, -136 dBm typical                                                          |
|                                                                                                                                | 10 to 500 MHz                                       | -142 dBm, -146 dBm typical                            | -132 dBm, -136 dBm typical                                                          |
|                                                                                                                                | 500 to 2.5 GHz                                      | -141 dBm, -145 dBm typical                            | -131 dBm, -135 dBm typical                                                          |
|                                                                                                                                | 2.5 to 4 GHz                                        | -140 dBm, -144 dBm typical                            | -130 dBm, -134 dBm typical                                                          |
|                                                                                                                                | 4 to 6 GHz                                          | -138 dBm, -140 dBm typical                            | -128 dBm, -130 dBm typical                                                          |
| Preamp on                                                                                                                      | 6 to 7 GHz                                          | -136 dBm, -138 dBm typical                            | -126 dBm, -128 dBm typical                                                          |
|                                                                                                                                | 9 to 100 kHz                                        | -110 dBm, nominal                                     | -100 dBm, nominal                                                                   |
|                                                                                                                                | 100 kHz to 1 MHz                                    | -131 dBm, -150 dBm typical                            | -121 dBm, -140 dBm typical                                                          |
|                                                                                                                                | 1 to 10 MHz                                         | -148 dBm, -163 dBm typical                            | -138 dBm, -153 dBm typical                                                          |
|                                                                                                                                | 10 to 500 MHz                                       | -161 dBm, -164 dBm typical                            | -151 dBm, -154 dBm typical                                                          |
|                                                                                                                                | 500 to 2.5 GHz                                      | -159 dBm, -162 dBm typical                            | -149 dBm, -152 dBm typical                                                          |
|                                                                                                                                | 2.5 to 4 GHz                                        | -158 dBm, -161 dBm typical                            | -148 dBm, -151 dBm typical                                                          |
| Preamp on                                                                                                                      | 4 to 6 GHz                                          | -155 dBm, -158 dBm typical                            | -145 dBm, -148 dBm typical                                                          |
|                                                                                                                                | 6 to 7 GHz                                          | -150 dBm, -154 dBm typical                            | -140 dBm, -144 dBm typical                                                          |
|                                                                                                                                |                                                     |                                                       |                                                                                     |
| Spurious response                                                                                                              |                                                     |                                                       |                                                                                     |
| Input terminated and 0 dB input attenuation, preamp off 20 to 30°C                                                             |                                                     |                                                       |                                                                                     |
| Residual response                                                                                                              | < -90 dBm, typical -98 dBm                          |                                                       |                                                                                     |
| -30 dBm signal at input mixer 20 to 30°C                                                                                       |                                                     |                                                       |                                                                                     |
| Input related spurious                                                                                                         | < -75 dBc                                           |                                                       |                                                                                     |
|                                                                                                                                | Exceptions:                                         |                                                       |                                                                                     |
|                                                                                                                                | -65 dBc (F1 - 21.4 MHz, with F1 input frequency)    |                                                       |                                                                                     |
|                                                                                                                                | -65 dBc (F1 - 5.35 MHz, with F1 input frequency)    |                                                       |                                                                                     |
| -65 dBc (F1 = 4155 MHz, with F1 input frequency)                                                                               |                                                     |                                                       |                                                                                     |
| Mixer signal level at -30 dBm, input attenuation 0 dB, preamp off, 20 to 30°C                                                  |                                                     |                                                       |                                                                                     |
| Second harmonic distortion                                                                                                     | 50 MHz to 3 GHz                                     | < -65 dBc                                             |                                                                                     |
|                                                                                                                                | 3 to 7 GHz                                          | < -70 dBc                                             |                                                                                     |
| Two -20 dBm tones at input mixer, spaced by 100 kHz, input attenuation 0 dB, preamp off, reference level > -20 dBm, 20 to 30°C |                                                     |                                                       |                                                                                     |
| Third-order intercept (TOI)                                                                                                    | 50 to 300 MHz                                       | +9 dBm, +12 dBm typical                               |                                                                                     |
|                                                                                                                                | 300 MHz to 7 GHz                                    | +11 dBm, +15 dBm typical                              |                                                                                     |
| Phase noise                                                                                                                    |                                                     | Specification                                         | Typical                                                                             |
| 20 to 30°C, center frequency = 1 GHz                                                                                           |                                                     |                                                       |                                                                                     |
| Offset from CF signal                                                                                                          | 10 kHz                                              |                                                       | < -90 dBc/Hz                                                                        |
|                                                                                                                                | 100 kHz                                             | < -98 dBc/Hz                                          | < -100 dBc/Hz                                                                       |
|                                                                                                                                | 1 MHz                                               | < -119 dBc/Hz                                         | < -121 dBc/Hz                                                                       |
| Residual FM                                                                                                                    |                                                     | Specification                                         | Typical                                                                             |
| 20 to 30°C, RBW 100 Hz                                                                                                         |                                                     | ≤ 10 Hz p-p in 20 ms, nominal                         |                                                                                     |

# Tracking Generator (Option TG7)

| Output frequency                                         |                                                                                              | Supplemental information                                                                                                                     |
|----------------------------------------------------------|----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| Range                                                    | 5 MHz to 7 GHz                                                                               |                                                                                                                                              |
| Resolution                                               | 1 Hz                                                                                         |                                                                                                                                              |
| Resolution bandwidth                                     | 3 kHz to 3 MHz                                                                               |                                                                                                                                              |
| Output power level                                       |                                                                                              |                                                                                                                                              |
| Range                                                    | -20 to 0 dBm                                                                                 |                                                                                                                                              |
| Resolution                                               | 1 dB                                                                                         |                                                                                                                                              |
| Output flatness                                          | ± 2 dB, nominal                                                                              |                                                                                                                                              |
| VSWR                                                     | < 2 : 1, nominal                                                                             | 5 MHz to 7 GHz, input attenuator ≥ 12 dB                                                                                                     |
| Dyanmic range                                            | Max. output power – DANL with 3 kHz RBW                                                      |                                                                                                                                              |
| Connector and impedance                                  | N-type female, 50 Ω                                                                          |                                                                                                                                              |
| Maximum safe reverse level                               |                                                                                              |                                                                                                                                              |
| Average total power                                      | 30 dBm (1W)                                                                                  |                                                                                                                                              |
| DC voltage                                               | ± 50 V <sub>DC</sub>                                                                         |                                                                                                                                              |
| Reflection measurement (Option RM7, requires Option TG7) |                                                                                              |                                                                                                                                              |
| Frequency range                                          | 5 MHz to 7 GHz                                                                               |                                                                                                                                              |
| Frequency resolution                                     | 100 kHz                                                                                      |                                                                                                                                              |
| Output power                                             | -4 to +2 dBm, nominal                                                                        |                                                                                                                                              |
| Measurement speed                                        | 2 s (full span 5 MHz to 7 GHz)                                                               |                                                                                                                                              |
| Number of data points                                    | 461                                                                                          |                                                                                                                                              |
| Directivity of calibrator                                | > 40 dB                                                                                      | Mechanical OSL calibrator                                                                                                                    |
| Return loss                                              |                                                                                              |                                                                                                                                              |
| Range                                                    | 0 to 60 dB                                                                                   |                                                                                                                                              |
| Accuracy                                                 | $20 \times \log_{10} (1.1 + 10^{(-D-RL)/20}) + 0.016 \times 10^{(-RL/20)} + 10^{(-3+RL/20)}$ | Nominal, after average                                                                                                                       |
|                                                          | D: Directivity of calibrator                                                                 |                                                                                                                                              |
|                                                          | RL: Return loss value of the DUT                                                             |                                                                                                                                              |
| Resolution                                               | 0.01 dB                                                                                      |                                                                                                                                              |
| Voltage standing wave ratio                              |                                                                                              |                                                                                                                                              |
| Range                                                    | 1 to 65                                                                                      |                                                                                                                                              |
| Resolution                                               | 0.01                                                                                         |                                                                                                                                              |
| Accuracy                                                 | Refer to return loss accuracy                                                                |                                                                                                                                              |
| Insertion loss                                           |                                                                                              |                                                                                                                                              |
| Range                                                    | 0 to 30 dB                                                                                   |                                                                                                                                              |
| Resolution                                               | 0.01 dB                                                                                      |                                                                                                                                              |
| Distance-to-fault (DTF)                                  |                                                                                              |                                                                                                                                              |
| Vertical range                                           | 0 to 60 dB                                                                                   | Return loss                                                                                                                                  |
|                                                          | 1 to 65                                                                                      | VSWR                                                                                                                                         |
| Range                                                    | (Number of data points – 1) × resolution                                                     | Number of data points = 461                                                                                                                  |
| Resolution (meter)                                       | $(1.5 \times 10^8) \times (V_P)/(F_2 - F_1)$ Hz                                              | V <sub>P</sub> is the cable's relative propagation velocity<br>F <sub>2</sub> is the stop frequency<br>F <sub>1</sub> is the start frequency |
| Immunity to interference                                 |                                                                                              |                                                                                                                                              |
| On-channel                                               | +17 dBm, nominal                                                                             |                                                                                                                                              |
| On-frequency                                             | -5 dBm, nominal                                                                              |                                                                                                                                              |

# Other Options

| AM/FM modulation analysis (Option AMA)   |                                                                                              | Supplemental information                                                                              |
|------------------------------------------|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| Frequency range                          | 10 MHz to 7 GHz                                                                              |                                                                                                       |
| Carrier power accuracy                   | $\pm 1.8$ dB, nominal                                                                        |                                                                                                       |
| Carrier power range                      | -30 to +10 dBm                                                                               | 100 kHz to 2 MHz                                                                                      |
|                                          | -30 to +20 dBm                                                                               | 2 MHz to 7 GHz                                                                                        |
| Carrier power displayed resolution       | 0.01 dBm                                                                                     |                                                                                                       |
| AM measurement (included in Option AMA)  |                                                                                              |                                                                                                       |
| Modulation rate                          | 20 Hz to 100 kHz                                                                             |                                                                                                       |
| Accuracy                                 | 1 Hz, nominal                                                                                | Modulation rate < 1 kHz                                                                               |
|                                          | < 0.1% modulation rate, nominal                                                              | Modulation rate $\geq 1$ kHz                                                                          |
| Depth                                    | 5 to 95%                                                                                     |                                                                                                       |
| Accuracy                                 | $\pm 4\%$ , nominal                                                                          |                                                                                                       |
| FM measurement (included in Option AMA)  |                                                                                              |                                                                                                       |
| Modulation rate                          | 20 Hz to 200 kHz                                                                             |                                                                                                       |
| Accuracy                                 | 1 Hz, nominal                                                                                | Modulation rate < 1 kHz                                                                               |
|                                          | < 0.1% modulation rate, nominal                                                              | Modulation rate $\geq 1$ kHz                                                                          |
| Deviation                                | 20 Hz to 400 kHz                                                                             |                                                                                                       |
| Accuracy                                 | $\pm 4\%$ , nominal                                                                          |                                                                                                       |
| ASK/FSK modulation analysis (Option DMA) |                                                                                              |                                                                                                       |
| Frequency range                          | 2.5 MHz to 6 GHz                                                                             |                                                                                                       |
| Carrier power accuracy                   | $\pm 2$ dB, nominal                                                                          |                                                                                                       |
| Carrier power range                      | -30 to +20 dBm, nominal                                                                      |                                                                                                       |
| Carrier power displayed resolution       | 0.01 dBm                                                                                     |                                                                                                       |
| ASK measurement (included in Option DMA) |                                                                                              |                                                                                                       |
| Symbol rate range                        | 100 Hz to 100 kHz                                                                            |                                                                                                       |
| Modulation depth/index range             | 5 to 95%                                                                                     |                                                                                                       |
| Accuracy                                 | $\pm 4\%$ of reading, nominal                                                                |                                                                                                       |
| Displayed resolution                     | 0.1%                                                                                         |                                                                                                       |
| FSK measurement (included in Option DMA) |                                                                                              |                                                                                                       |
| FSK deviation                            | 100 Hz to 400 kHz                                                                            |                                                                                                       |
| Symbol rate range                        | 100 Hz to 20 kHz                                                                             | $1 \leq \beta \leq 20$ ( $\beta$ is the ratio of frequency deviation to symbol rate (deviation/rate)) |
|                                          | 20 to 50 kHz                                                                                 | $1 \leq \beta \leq 8$                                                                                 |
|                                          | 50 to 100 kHz                                                                                | $1 \leq \beta \leq 4$                                                                                 |
| Accuracy                                 | $\pm 4\%$ , nominal                                                                          |                                                                                                       |
| Displayed resolution                     | 0.01 Hz                                                                                      |                                                                                                       |
| Channel scanner (Option SCN)             |                                                                                              |                                                                                                       |
| Scan modes                               | Top N, bottom N, and list                                                                    |                                                                                                       |
| Channels displayed                       | 1 to 20                                                                                      |                                                                                                       |
| Displayed orientation                    | Vertical                                                                                     | Number of channels $\leq 5$                                                                           |
|                                          | Horizontal                                                                                   | Number of channels > 5                                                                                |
| Chart                                    | Bar chart, and time chart                                                                    |                                                                                                       |
| Log file                                 | *.csv                                                                                        |                                                                                                       |
| Spectrum monitor (Option MNT)            |                                                                                              |                                                                                                       |
| Display modes                            | Spectrogram                                                                                  |                                                                                                       |
|                                          | Spectrum trace                                                                               |                                                                                                       |
|                                          | Combination of spectrogram and spectrum trace in one screen                                  |                                                                                                       |
| Security features (Option SEC)           |                                                                                              |                                                                                                       |
| Security erase method                    | Erase the entire user flash memory by writing single character "1" over all memory locations | Non-recoverable                                                                                       |
| Port control                             | Disable or enable LAN or USB connectors                                                      |                                                                                                       |

| Task planner (Option TPN)                                                                                                                                      |                                                                                                                      | Supplemental information                                                                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| Task plan execution mode                                                                                                                                       | Auto, manual, and manual if fail                                                                                     | Complementary task plan editor is available with <a href="#">Keysight HSA and BSA PC software</a> |
| Task plan file                                                                                                                                                 | *.TPN                                                                                                                |                                                                                                   |
| Number of tasks                                                                                                                                                | Maximum 20 in a single .TPN file                                                                                     |                                                                                                   |
| Measurements supported                                                                                                                                         | Regular spectrum analysis and power suite (channel power, ACPR and OBW)                                              |                                                                                                   |
|                                                                                                                                                                | For more information, visit <a href="http://www.keysight.com/find/taskplanner">www.keysight.com/find/taskplanner</a> |                                                                                                   |
| USB average power sensor support (Option PWM)                                                                                                                  |                                                                                                                      |                                                                                                   |
| Power sensor supported                                                                                                                                         | Keysight U2000 Series USB power sensor                                                                               |                                                                                                   |
| Frequency range                                                                                                                                                | 9 kHz to 24 GHz                                                                                                      | Sensor dependent                                                                                  |
| Dynamic range                                                                                                                                                  | -60 to +44 dBm                                                                                                       | Sensor dependent                                                                                  |
| USB peak and average power senesor support (Option PWP)                                                                                                        |                                                                                                                      |                                                                                                   |
| Power sensor supported                                                                                                                                         | Keysight U2020 and U2042/44 X-Series USB peak and average power sensor                                               |                                                                                                   |
| Frequency range                                                                                                                                                | 50 MHz to 40 GHz                                                                                                     | Sensor dependent                                                                                  |
| Dynamic range                                                                                                                                                  | -30 to +20 dBm                                                                                                       |                                                                                                   |
| Base band input (Option BB1)                                                                                                                                   |                                                                                                                      |                                                                                                   |
| Frequency range                                                                                                                                                |                                                                                                                      |                                                                                                   |
|                                                                                                                                                                | 9 kHz to 10 MHz                                                                                                      |                                                                                                   |
| Frequency span                                                                                                                                                 |                                                                                                                      |                                                                                                   |
|                                                                                                                                                                | 100 Hz to 9.997 MHz                                                                                                  |                                                                                                   |
| Frequency resolution                                                                                                                                           |                                                                                                                      |                                                                                                   |
|                                                                                                                                                                | 1 Hz                                                                                                                 |                                                                                                   |
| Measurement range                                                                                                                                              |                                                                                                                      |                                                                                                   |
|                                                                                                                                                                | DANL to +10 dBm (9 kHz to 2 MHz)                                                                                     |                                                                                                   |
|                                                                                                                                                                | DANL to +20 dBm (2 MHz to 10 MHz)                                                                                    |                                                                                                   |
| Overall amplitude accuracy                                                                                                                                     |                                                                                                                      |                                                                                                   |
| 20 to 30°C, 30 to 70% RH, peak detector, input signal -50 to 0 dBm, 95th percentile                                                                            |                                                                                                                      |                                                                                                   |
| 9 to 100 kHz                                                                                                                                                   | ± 2.5 dB                                                                                                             |                                                                                                   |
| 100 kHz to 10 MHz                                                                                                                                              | ± 1.5 dB                                                                                                             |                                                                                                   |
| Displayed average noise level                                                                                                                                  |                                                                                                                      |                                                                                                   |
| 20 to 30°C, 30 to 70% RH, 10 Hz RBW, 1 Hz VBW, 50 $\Omega$ termination on input, 0 dB attenuation, RMS detector, Trace average > 40, reference level < -35 dBm |                                                                                                                      |                                                                                                   |
| 9 to 100 kHz                                                                                                                                                   | -135 dBm, nominal                                                                                                    |                                                                                                   |
| 100 kHz to 10 MHz                                                                                                                                              | -145 dBm                                                                                                             |                                                                                                   |
| Residual response                                                                                                                                              |                                                                                                                      |                                                                                                   |
|                                                                                                                                                                | < -120 dBm, nominal                                                                                                  | 20 to 30°C, Ref level < -35 dBm                                                                   |
|                                                                                                                                                                |                                                                                                                      | 50 $\Omega$ termination on input, 0 dB attenuation                                                |
| Phase noise                                                                                                                                                    |                                                                                                                      |                                                                                                   |
| Fc = 5 MHz, RBW = 1 kHz, VBW = 30 Hz. Ref level -30 dBm, input attenuation 0 dB, input signal -20 dBm, average > 40                                            |                                                                                                                      |                                                                                                   |
| Offset 30 kHz                                                                                                                                                  | -120 dBc/Hz, nominal                                                                                                 |                                                                                                   |
| Offset 100 kHz                                                                                                                                                 | -127 dBc/Hz, nominal                                                                                                 |                                                                                                   |
| Offset > 200 kHz                                                                                                                                               | -130 dBc/Hz, nominal                                                                                                 |                                                                                                   |
| Second harmonic distortion                                                                                                                                     |                                                                                                                      |                                                                                                   |
| F > 100 kHz, signal level -30 dBm, ref level -30 dBm, attenuation 0 dB                                                                                         |                                                                                                                      |                                                                                                   |
|                                                                                                                                                                | < -55 dBc nominal                                                                                                    |                                                                                                   |
| Third order intermodulation distortion                                                                                                                         |                                                                                                                      |                                                                                                   |
| F > 100 kHz, -20 dBm tones at 100 kHz apart, ref level -20 dBm, attenuation 0 dB                                                                               |                                                                                                                      |                                                                                                   |
|                                                                                                                                                                | < -55 dBc, nominal                                                                                                   |                                                                                                   |

# Inputs and Outputs

| Front panel             |                                      |                                                             | Supplemental information                                  |
|-------------------------|--------------------------------------|-------------------------------------------------------------|-----------------------------------------------------------|
| RF input connector      | N-type female, 50 $\Omega$ , nominal |                                                             |                                                           |
| VSWR                    | < 1.5 : 1, nominal                   | 10 MHz to 3 GHz                                             | Input attenuator $\geq 10$ dB, or 20 dB fixed attenuation |
|                         | < 2.0 : 1, nominal                   | 3 to 7 GHz                                                  |                                                           |
| Calibration output      | Amplitude                            | $-25 \pm 0.25$ dBm                                          |                                                           |
|                         | Frequency                            | 40 MHz                                                      |                                                           |
|                         | Connector and impedance              | BNC-type female, 50 $\Omega$ , nominal                      |                                                           |
| Probe power             | Voltage / Current                    | +15 V, 150 mA maximum<br>-12.6 V, 150 mA maximum            |                                                           |
| RF output connector     | N-type female, 50 $\Omega$ , nominal | Option TG7 installed                                        |                                                           |
| USB interface (host)    | A plug, version 1.1                  |                                                             |                                                           |
| Rear panel              |                                      |                                                             |                                                           |
| 10 MHz reference output | Output amplitude                     | > 0 dBm                                                     |                                                           |
|                         | Frequency                            | 10 MHz $\pm$ (10 MHz $\times$ frequency reference accuracy) |                                                           |
|                         | Connector and impedance              | BNC-type female, 50 $\Omega$ , nominal                      |                                                           |
| 10 MHz reference input  | Input amplitude                      | -5 to +10 dBm, nominal                                      |                                                           |
|                         | Frequency                            | 10 MHz                                                      |                                                           |
|                         | Connector and impedance              | BNC-type female, 50 $\Omega$ , nominal                      |                                                           |
| External trigger input  | Input amplitude                      | 5 V TTL level; -12.6 V, 150 mA max (nominal)                |                                                           |
|                         | Connector and impedance:             | BNC-type female, 10 k $\Omega$                              |                                                           |
| LAN TCP/IP interface    | 10Base-T, RJ-45 connector            |                                                             |                                                           |
| USB interface (device)  | B plug, version 1.1                  |                                                             |                                                           |
| Mini USB (device)       | Mini-AB female, version 1.1          |                                                             |                                                           |
| GPIO interface          | IEEE-488 bus connector               | Optional G01 installed                                      |                                                           |

# General

| Temperature and relative humidity                          |                     | Supplemental information |
|------------------------------------------------------------|---------------------|--------------------------|
| Operating temperature range                                | +5 to +45°C         |                          |
| Storage temperature range                                  | -20 to +70°C        |                          |
| Relative humidity                                          | < 95%               |                          |
| EMC                                                        |                     |                          |
| Complies with European EMC Directive 2004/108/EC           |                     |                          |
| IEC/EN 61326-1 / IEC/EN 61326-2-1                          |                     |                          |
| CISPR Pub 11 group 1, class A                              |                     |                          |
| AS/NZS CISPR 11:2004                                       |                     |                          |
| ICES/NMB-001:2006                                          |                     |                          |
| 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 2006/95/EC    |                     |                          |
| • IEC/EN 61010-1 3rd Edition                               |                     |                          |
| • Canada: CSA C22.2 No. 61010-1-04                         |                     |                          |
| • 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 to 240 VAC, 50 to 60 Hz | Auto ranging |
| Power consumption               | ≤ 25 W, < 20 W, typical     |              |

#### Display

|            |                                        |  |
|------------|----------------------------------------|--|
| Resolution | 640 x 480                              |  |
| Size       | 165.1 mm (6.5 inch) diagonal (nominal) |  |

#### Data storage

|          |                                            |  |
|----------|--------------------------------------------|--|
| Internal | 64 MB nominal                              |  |
| External | Supports USB 3.0 compatible memory devices |  |

#### Weight (without options)

|          |                             |  |
|----------|-----------------------------|--|
| Net      | 7.9 kg (17.4 lbs), nominal  |  |
| Shipping | 14.5 kg (30.9 lbs), nominal |  |

#### Dimensions

|        |                     |                              |
|--------|---------------------|------------------------------|
| Height | 132.5 mm (5.2 inch) | Occupies 3U height in a rack |
| Width  | 320 mm (12.6 inch)  |                              |
| Length | 400 mm (15.7 inch)  |                              |

#### Warranty

The N9322C spectrum analyzer is supplied with a 5-year warranty

#### Calibration cycle

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



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