



Agilent 71200C Microwave Spectrum Analyzer, 50 kHz to 22 GHz

Product Specifications

Frequency Range

50 kHz to 22 GHz

Tunable in 1 Hz increments

N 1st IF Frequency

H=high IF (3.6214 GHz)

L=low IF (321.4 MHz) 1 H- 50 kHz to 2.9 GHz

N=harmonic number 1 L- 2.7 GHz to 6.2 GHz

2 L- 6.0 GHz to 12.7 GHz

3 L+ 12.0 GHz to 19.9 GHz

4 L+ 19.7 GHz to 22 GHz

Frequency Readout Accuracy

Span ≤ 10 MHz $\times N^1$: $\pm[(\text{freq readout} \times \text{freq ref accuracy})$

$\pm 1.0\%$ of Span + 10 Hz]

Span > 10 MHz $\times N^1$

Sweep ≥ 20 ms $\pm[(\text{freq readout} \times \text{freq ref accuracy})$

+ 1.5% of span + 10 Hz]

Sweep ≥ 10 ms $\pm[(\text{freq readout} \times \text{freq ref accuracy})$

+ 2.5% of span + 10 Hz]

Frequency Span

Range: 0 to 22 GHz in 0.5% increments

Accuracy

Span ≤ 10 MHz: $\pm[1\%$ of span + (span \times freq ref accuracy)]

Span > 10 MHz

Sweep ≥ 50 ms: $\pm[1.5\%$ of span + (span \times freq ref accuracy)]

Sweep ≥ 20 ms: $\pm[2.5\%$ of span + (span \times freq ref accuracy)]

Sweep ≥ 10 ms: $\pm[4.0\%$ of span + (span \times freq ref accuracy)]

Frequency Reference Accuracy

with (Agilent 70310A) (without Agilent 70310A)

Aging: $> 1 \times 10^{-7}$ /year $> 3 \times 10^{-6}$ /year

7-Day Average: $> 5 \times 10^{-10}$ /day

Temperature Drift: $> 7 \times 10^{-9}$ $> 1 \times 10^{-5}$



Agilent Technologies

Spectral Purity²

Frequency Range Noise Sideband Offset
50 kHz to 2.9 GHz <-108 dBc/Hz 10 kHz
2.7 to 6.2 GHz <-108 dBc/Hz 30 kHz
6.0 to 12.7 GHz <-102 dBc/Hz 30 kHz
12.5 to 19.9 GHz <-98 dBc/Hz 30 kHz
19.7 to 22/26.5 GHz <-96 dBc/Hz 30 kHz
Line and System Related Sidebands:
<-65 dBc + 20 log N¹

Residual FM

Span >10 MHz x N¹: <25 kHz p-p in 0.1 s
(measurement BW=100 kHz)
Span <=10 MHz x N¹: Determined from phase-noise sidebands

Frequency Drift

For spans >10 MHz x N¹: freq drift is ±1 kHz/s and +150 kHz/°C
(Errors due to drift are not cumulative sweep to sweep.)

Sweep Time

Range (Continuous): 10 ms to 1000 s
Accuracy: ±2%
With **Agilent 70700A**:
Swept freq span: 15 ms to 355 s
Fixed freq (zero span): 801 μs to 355 s with 800 point trace
Trigger: free run, line, video, external
Resolution Bandwidth (3 dB, synchronously tuned):
Range (1, 3, 10, and 10% increments, except 3 kHz to 10 kHz)
Agilent 70902A: 10 Hz to 300 kHz
Agilent 70903A: 100 kHz to 3 MHz
Accuracy: ±20%
Selectivity Bandwidth (-60 dB/-3 dB):
10 Hz to 3 kHz: <12:1
10 kHz to 3 MHz: <16:1

Video Bandwidth

Range (1, 3, 10 sequence)
Agilent 70902A: 3 Hz to 300 kHz
Agilent 70903A: 300 Hz to 3 MHz
(When set to maximum (300 kHz or 3 MHz), effective bandwidth is greater than specified.)
Accuracy: ±20% (characteristic)
¹N=Harmonic mixing band constant.
²Refer to Figure 1 in the Spectrum Analyzer Overview for typical phase noise.
Amplitude Specifications

Maximum Safe Input Power

AC Average Continuous
0 dB Attenuation: +15 dBm
10 dB Attenuation: +25 dBm
>10 dB Attenuation: +30 dBm
Pulse Power: 100 watts, 10 ms pulse (>=40 dB attenuation)
dc: 0 volts



Display Range (10 divisions)

Calibration Log: 0.01 to 20 dB/div in 0.5% increments

Linear: 0 to 10% of reference level per division

Reference Level Range

Log: +30 to -1400 dBm

Linear: 7.07 V to 22 nV

Calibrator Uncertainty: ± 0.3 dB (-10 dBm, 300 MHz)**Input Attenuator Switching Repeatability:** ± 0.2 dB**IF Gain Accuracy**

Gain 20 to 30 °C 0 to 50 °C

10 dB ± 0.2 dB ± 0.2 dB20 dB ± 0.2 dB ± 0.2 dB30 dB ± 0.2 dB ± 0.3 dB40 dB ± 0.2 dB ± 0.5 dB50 dB ± 0.2 dB ± 0.6 dB**Scale Fidelity**

Bandwidth Fidelity

Log, Corrected (1-3-10)

Agilent 70902A:(0 to 90 dB) 10 Hz ± 0.7 dB30 Hz to 100 kHz ± 0.5 dB300 kHz ± 0.7 dBLog, Uncorrected: All ± 3.0 dBIncremental, Corrected: All ± 0.1 dB/1 dBLinear $\pm 7.5\%$ of reference level**Amplitude Temperature Drift** (nominal)10 dB Input Attenuation ± 0.05 dB/°C

100 Hz Res BW (HP 70902A IF)

300 kHz Res BW (HP 70903A IF)

(Accumulated error is eliminated by running internal correction routine.)

Resolution Bandwidth Switching RepeatabilityIn 1, 3, 10 Sequence: ± 0.1 dBAll Bandwidths: ± 3 dB (uncorrected)**Marker Resolution:** ± 0.03 dB

Input/Output Characteristics

Front panel only for standard configuration and Option 002.

See individual module characteristics for complete information.

Agilent 70900B LO Section

300 MHz Calibrator

Output: BNC (f), 50 ohms (nominal)

Output Power: -10 dBm ± 0.3 dB

Frequency Accuracy: 300 MHz x freq reference accuracy

Agilent 70905A: Type N (f); 50 ohms (nominal)
LO Emissions: <-10 dBm with 10 dB attenuation (nominal)
VSWR (>=10 dB Attenuation)
Frequency VSWR (nominal)
0 to 12.7 GHz <1.7:1
12.5 to 18.0 GHz <2.0:1
18.0 to 22 GHz <2.5:1

Agilent 70902A IF Section

Auxiliary Video Output: BNC (f), 0 to 1 V, 1k ohms (nominal),
3 MHz IF Output (linear): BNC (f), 50 ohms, 1.5:1 VSWR (nominal)
Output Power: -15 dBm (nominal) with -10 dBm RF input,
0 dB attenuation and -10 dBm reference level

HP-IB Codes: SHI, AH1, T6, L4, SR1, RL1, DC1, PP0,
DT1, E2, C1

General Specifications

Agilent 71200C System Components

Agilent 70001A
Agilent 70004A
Agilent 70900B
Agilent 70310A
Agilent 70902A
Standard: **Agilent 7095A**
Opt 002: **Agilent 70905B, Agilent 70600A**

Environmental

Temperature
Operational: 0 to +55 °C
Storage: -40 to +75 °C
Humidity
Operational: 0 to 95% relative humidity at 45 °C
EMC: Conducted and radiated interference is in compliance with CISPR pub 11, FTZ 526/1979, and MIL-STD 461B, RE02/part 7.
Vibration and Shock: in compliance with MIL-T-28800E
Type III Class 3
Power Requirements: see requirements for Agilent 70001A and Agilent 70004A
all power requirements supplied by the mainframe (HP 70001A or 70004A)
Weight (nominal)

Agilent 71200C Standard: 47.7 kg (105.6 lb)

Dimensions

Agilent 70001A Mainframe:

177.0 mm H x 425.4 mm W x 526.0 mm L
(6.97 in x 16.75 in x 20.7 in)

Agilent 70004A Display: 222.0 mm H x 425.4 mm W x 526.0 mm L
(8.74 in x 16.75 in x 20.7 in)

Warranty and Calibration

Warranty: 1 year (extendible with options)
Calibration Cycle: 3 years recommended



Features and Compatibility

Agilent 70004A Display Features: memory card, direct-to-disk, keyboard (for title mode and writing small DLPs), direct plot (buffered), direct print, full color display

Mass Storage

Memory card: 32 KB or 128 KB RAM per card

External: SS80-compatible hard or flexible disk User Memory: 128 KB minimum, 32 k bytes minimum with firmware before 901008, about 2.5 KB to store an 800 point trace with its state. System memory is reduced when slave modules are added. Optional 1 MB memory.

Compatible Accessory Modules (slave modules to the **Agilent 70900B** master module)

Agilent 70903A IF Section

Agilent 70621A and **Agilent 70620B** Preamplifiers

Agilent 70810B Lightwave Section

Agilent 70907B External Mixer Interface Module

Agilent 70700A Digitizer

Agilent 70205A Monochrome Display

Software Available

Agilent 11990A Performance Verification Software