

NETWORK ANALYZERS

Complete Characterization of Linear Networks (cont'd)

Network Analyzer Product Line Summary

HP Model	Frequency Range	Source	Measurement Capabilities
HP 35665A Dual-Channel Dynamic Signal Analyzer (page 220)	122 μ Hz to 51.2 kHz	Swept and fixed sine chirp, random, burst random, and arbitrary waveform	Transfer functions, magnitude/phase, 20-pole/20-zero curve fitter, frequency-response synthesis, time-domain functions, and spectrum analysis. HP-IB programmable.
HP 3563A/3562A Dual-Channel Control Systems Analyzer (page 221)	64 μ Hz to 100 kHz	Analog and digital swept and fixed sine, chirp, burst chirp, random noise, burst random noise, step, pulse, ramp, and arbitrary	Transfer functions, magnitude/phase, 40-pole/40-zero curve fitter (S- and Z-domains), frequency-response synthesis (S- and Z-domains), time-domain functions, and spectrum analysis with analog or digital input signals. HP-IB programmable. Note: 3562A provides analog interface only.
HP 3577B Network Analyzer (page 283)	5 Hz to 200 MHz	Integrated synthesized source	Transfer functions, magnitude/phase, group delay, S-parameters, insertion loss, gain/attenuation, electrical length, gain compression, SWR, impedance, HP Instrument BASIC optional. HP-IB programmable.
HP 3589A Spectrum/Network Analyzer (page 232)	10 Hz to 150 MHz	Integrated synthesized source	Transfer functions, magnitude/phase, group delay, S-parameters, impedance, SWR, spectrum analysis, including gating. HP Instrument BASIC optional. HP-IB programmable.
HP 4195A Network/Spectrum/ Impedance Analyzer (page 285)	10 Hz to 500 MHz	Integrated synthesized source	Transfer functions, magnitude/phase, insertion loss/gain, attenuation, group delay, S-parameters, return loss, SWR, complex impedance, accuracy enhancement. HP-IB programmable.
HP 8751A Network Analyzer (page 287)	5 Hz to 500 MHz	Integrated synthesized source	Transfer functions, magnitude/phase, insertion loss/gain, attenuation, gain compression, S-parameters, electrical length, group delay, deviation from linear phase. Impedance-magnitude/phase: return loss, $R + jX$. Full accuracy enhancement. HP Instrument BASIC capability. Built-in 3.5-in flexible disk (LIF/DOS format). HP-IB capability.
HP 87510A Gain/Phase Analyzer (page 289)	100 kHz to 300 MHz	Integrated synthesized source	Transfer functions, magnitude/phase, insertion loss/gain, group delay, attenuation. Impedance-magnitude/phase. Electrical delay. HP IBASIC capability. Built-in 3/4-in flexible disk (LIF/DOS format). HP-IB capability.
HP 8752A/B Network Analyzer (page 294)	300 kHz to 1.3/3.0 GHz	Integrated synthesized source, test set and receiver	Transfer functions - magnitude/phase, insertion loss/gain, attenuation, gain compression, S-parameters, electrical length, group delay, deviation from linear phase. Impedance-magnitude/phase, return loss, $r + jx$, accuracy enhancement, time-domain capability. HP-IB programmable.
HP 8753C Network Analyzer (page 296)	300 kHz to 3 GHz/6 GHz	Integrated synthesized source 8752A: 50 Ω 8752B: 75 Ω	Transfer functions - magnitude/phase, insertion loss/gain, attenuation, gain compression, S-parameters, electrical length, group delay, deviation from linear phase. Impedance - magnitude/phase - Return Loss, $r + jx$. Full accuracy enhancement. Time-domain capability. Harmonic measurement capability. HP-IB programmable.
HP 8719C/8720C/8722C Network Analyzers (page 302)	50 MHz to 13.5 GHz (8719C) 50 MHz to 20 GHz (8720C) 50 MHz to 40 GHz (8722C)	Integrated synthesized source (1 Hz resolution optional)	Transfer functions - magnitude/phase, insertion loss/gain, attenuation, S-parameters, electrical length, group delay, deviation from linear phase. Impedance - magnitude/phase - Return Loss, $r + jx$. Full accuracy enhancement. Time-domain capability. HP-IB programmable.
HP 8510 Series Network Analyzers (page 305)	45 MHz to 110 GHz	HP 8350 Series Sweep Oscillators HP 8340B, 8341B Synthesized Sweepers HP 8360 Series Synthesized Sweepers	Transfer functions - magnitude/phase, insertion loss/gain, attenuation, S-parameters, electrical length, group delay, deviation from linear phase, impedance, return loss, $R + jx$. Active device characterization. Full accuracy enhancement. Time-domain capability. HP-IB programmable.

Vector Voltmeter

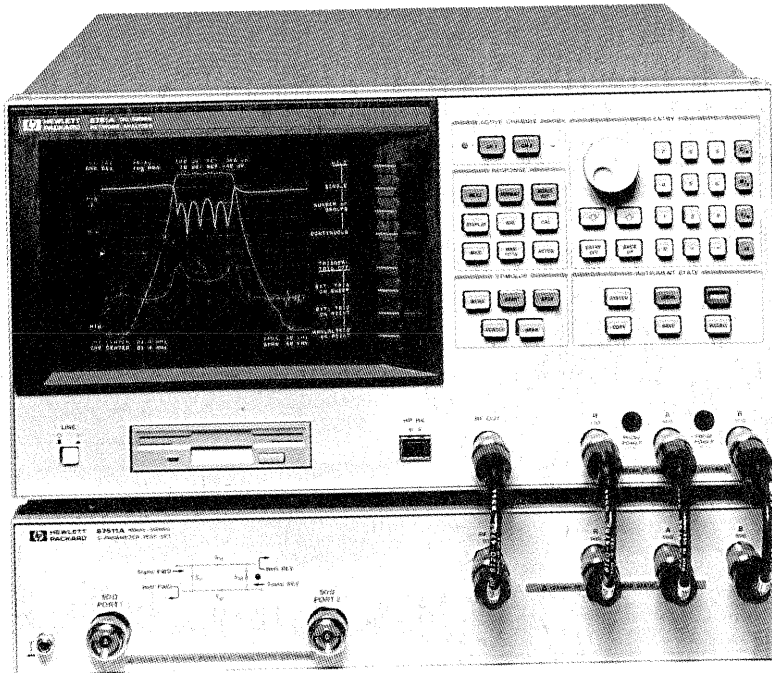
HP Model	Frequency Range	Source	Measurement Capabilities
HP 3575A Gain Phase Meter (page 283)	1 Hz to 13 MHz	None	Gain, phase, and amplitude
HP 8508A Vector Voltmeter (page 291)	0.1 MHz to 1 GHz 0.3 MHz to 2 GHz	None	Voltage, impedance Transfer functions, phase and amplitude HP-IB programmable

Scalar Analyzer

HP Model	Frequency Range	Source	Measurement Capabilities
HP 8757D/E Scalar Network Analyzers (page 275)	10 MHz to 110 GHz	HP 8350B Sweeper HP 8340B or 8341B Synthesized Sweepers HP 8360 Series Synthesized Sweepers	Scalar transmission/reflection measurements 50 Ω coax measurements 10 MHz to 50 GHz 75 Ω coax measurement 10 MHz to 2.4 GHz Waveguide measurements 26.5 to 110 GHz Open/short averaging, normalization, averaging, limit testing Storage registers, HP-IB programmable
HP 8711A RF Network Analyzer (page 292)	300 kHz to 1.3 GHz	Integrated synthesized source, T/R test set and receiver	Transmission/reflection measurements 50 Ω and 75 Ω measurements HP Instrument BASIC (IBASIC) Narrowband/broadband receivers Internal calibration, averaging, limit testing, internal disk and storage registers

- 5 Hz to 500 MHz
- 0.001 Hz, 0.001 dB, 0.001 degree, 10 ps resolution
- Full 2-port and interpolative calibration
- Conjugate matching analysis
- Built-in 1.44 Mbyte disk drive for save/recall
- Crisp color display with RGB output

- 10 updates of 201 sweep points per second
- 0.4 ms/point fast list sweep
- Up to 4 traces simultaneous measurement/display
- 8 active trace markers per channel
- HP Instrument BASIC for customization
- HP 41802A 1 M Ω input adapter



HP 8751A
with HP 87511A

HP 8751A Network Analyzer

The HP 8751A network analyzer is a high-throughput instrument with lab precision that covers 5 Hz to 500 MHz. The 8751A provides resolution of 0.001 Hz, 0.001 dB, 0.001 degree, and 10 ps for characterizing the linear behavior of either passive or active networks, devices, or components in the lab and the production test areas. The built-in 1.44 MB disk drive is for direct save/recall of instrument state, calibration data, and application programs for your customization. Dedicated 50/75 Ω S-parameter test sets, 50/75 Ω T/R test kits, and the 1 M Ω input adapters are all available.

Lab Precision

Versatile display format and built-in accuracy enhancement (2-port full cal, 1-port full cal, and interpolative calibration) are provided for high-precision measurement in lab environments. The 8751A's unique conjugate matching capability gives you the optimum power transfer to make designing easier.

Production Throughput

Unprecedented total throughput is a key feature of the HP 8751A. 0.4 ms/point measurement time is now applicable not only to linear sweep, but also to list sweep (programmable with IFBW and OSC output power) and to log sweep. The 8751A can also simultaneously measure/display up to four parameters with simple softkey operations. GO/NO-GO limit testing with an I/O handler control capability and HP Instrument BASIC are available to enhance total production test throughput.

Data Storable in LIF/DOS formatted floppy disk

A 1.44 MB disk drive is standard with the HP 8751A for easy save/recall of the instrument states, measurement data, calibration data, and application programs. Both HP LIF and DOS formats are supported. Saving data in DOS format enables you to see and manipulate data on a PC.

HP Instrument BASIC

HP Instrument BASIC (IBASIC) is available as an option. IBASIC enables you to easily create application programs for a measurement on the HP 8751A without using an external computer. IBASIC increases the productivity of a measurement, and reduces additional investment.

HP 8751A Specifications

Source

Frequency Characteristics

Range: 5 Hz to 500 MHz

Resolution: 1 mHz

Accuracy: ± 20 ppm, ± 1.0 ppm (Opt 001)

Stability: $\pm 2.5 \times 10^{-9}$ hours (typical $23 \pm 5^\circ$ C with Opt 001)

Output characteristics

Power Range: -50 to +15 dBm

Resolution: 0.1 dB

Flatness: ± 2.0 dB @ 5 Hz \leq freq. \leq 500 MHz ($23 \pm 5^\circ$ C, +0 dBm, relative to 50 MHz)

Level Accuracy: ± 0.5 dB (50 MHz, 0 dBm)

Level Linearity: ± 0.5 dB @ output level ≥ -35 dBm
 ± 1.5 dB @ output level < -35 dBm

(50 MHz, relative to 0 dBm)

Impedance: 50 Ω

NETWORK ANALYZERS

Baseband, IF and RF Analyzer, 5 Hz to 500 MHz (cont'd)

HP 8751A

Receiver

Frequency Range: 5 Hz to 500 MHz

Input Range: 0 dBm @ ATT = 20 dB
-20 dBm @ ATT = 0 dB

IF Bandwidth: 2 Hz, 20 Hz, 200 Hz, 2 kHz, 4 kHz

Noise Level: -130 dBm @ IFBW=20 Hz, ATT=0 dB,
frequency \geq 100 kHz

Maximum Input Level: 0 dBm

Impedance: 50 Ω

Crosstalk: < -100 dB

Dynamic Accuracy: ± 0.05 dB, $\pm 0.3^\circ$ (input level -10 to -60 dB,
20 Hz IFBW)

Delay Characteristics:

Aperture Frequency: 0.5 to 20%

Display Range: 10 ps to 500 s

Accuracy: (Phase accuracy)/(360 \times aperture)

Size: 425 mm W \times 235 mm H \times 553 mm D (16.75 in \times 9.25 in \times
21.77 in)

Weight: 28 kg (61.6 lb)

HP 8751A Accessories

HP 87511A 50 Ω S-Parameter Test Set

HP 87511B 75 Ω S-Parameter Test Set

The HP 87511A/B S-parameter test sets provide the capability to measure reflection and transmission characteristics (including S-parameters) of 2 port devices in either direction with a single connection. The frequency range of the HP 87511A/B test sets is 100 kHz to 500 MHz. The test sets are controlled from the HP 8751A.

HP 87511A/B Specifications

	HP 87511A	HP 87511B
Impedance	50 Ω	75 Ω
Frequency range	100 kHz to 500 MHz	100 kHz to 500 MHz
Directivity	≥ 35 dB from 300 kHz to 500 MHz	33 dB from 300 kHz to 500 MHz
Typical tracking S ₂₁ , S ₁₂ S ₁₁ , S ₂₂	± 1 dB, $\pm 5^\circ$ ± 1 dB, $\pm 5^\circ$	± 1 dB, $\pm 5^\circ$ ± 1 dB, $\pm 5^\circ$
Nominal insertion loss RF input to Port 1,2 RF input to R,A,B Port 1,2 to A,B	13 dB 19 dB 6 dB	19 dB 31 dB 6 dB
Max operating level	+20 dBm	+20 dBm
Damage level	+23 dBm	+23 dBm
Size	426 W \times 90 H \times 553 mm D	426 W \times 90 H \times 553 mm D
Weight	5.7 kg	5.7 kg

HP 87512A 50- Ω Transmission/Reflection Test Kit

HP 87512B 75- Ω Transmission/Reflection Test Kit

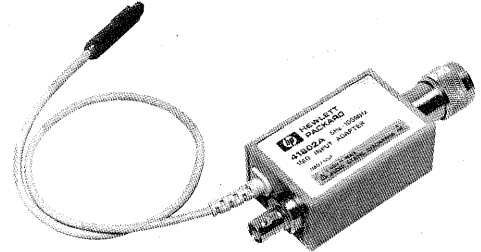
The HP 87512A/B transmission/reflection test kits provide the capability to measure transmission and reflection characteristics. The frequency range of the HP 87512A/B test kits is dc to 2 GHz.

HP 87512A/B Specifications

	HP 87512A	HP 87512B
Impedance	50 Ω	75 Ω
Insertion loss	10 \pm 1 dB typical	
Equivalent directivity	> 40 dB typical	
Equivalent source match	> 30 dB typical	> 25 dB typical

HP 41802A 1-M Ω Input Adapter

The HP 41802A 1 M Ω input adapter provides the capability to perform high-impedance measurement using HP network and spectrum analyzers. The frequency range of the HP 41802A input adapter is 5 Hz to 100 MHz. Passive probe is required for measurement (probing).



HP 41802A

HP 41802A Specifications

Frequency Range: 5 Hz to 100 MHz

Adaptor Gain: 0 dB \pm 0.5 dB @ 1 MHz

Input R, C (typical): 1 M Ω , 12 pF

1dB Gain Compression: 0.32 Vrms (+ 3dBm, 50 Ω terminated)

Damage Level: 2 Vrms, \pm 50 Vdc

Size: 28 mm H \times 42 mm W \times 100 mm D (1.1 in \times 1.65 in \times 3.94 in)

Weight: 400 g (0.88 lb)

Other Accessories

HP 85031B Precision 7 mm calibration kit

HP 85032B 50 Ω type-N calibration kit

HP 85033C Precision 3.5 mm calibration kit

HP 85036B 75 Ω type-N calibration kit

HP 11850C 50 Ω power splitter

HP 11850D 75 Ω power splitter

HP 11853A 50 Ω type-N accessory kit

HP 11854A 50 Ω BNC accessory kit

HP 11855A 75 Ω type-N accessory kit

HP 11856A 75 Ω BNC accessory kit

Ordering Information

HP 8751A Network Analyzer

Opt 001 High-Stability Frequency Reference

Opt 002 HP Instrument BASIC and 1 MB RAM

Opt 907 Front Handle Kit

Opt 908 Rack Mount Kit

Opt 909 Rack Flange and Handle Kit

Opt 910 Extra Operating Manual

Opt 915 Add Service Manual

HP 87511A 50 Ω S-Parameter Test Set

Opt 001 N-Type Port

HP 87511B 75 Ω S-Parameter Test Set

Options (common for the HP 87511A/B)

Opt 907 Front Handle Kit

Opt 908 Rack Mount Kit

Opt 909 Rack Flange and Handle Kit

Opt 910 Extra Operating Manual

HP 87512A 50 Ω Transmission/Reflection Test Kit

HP 87512B 75 Ω Transmission/Reflection Test Kit

HP 41802A 1 M Ω Input Adapter

HP 41800A Active Probe