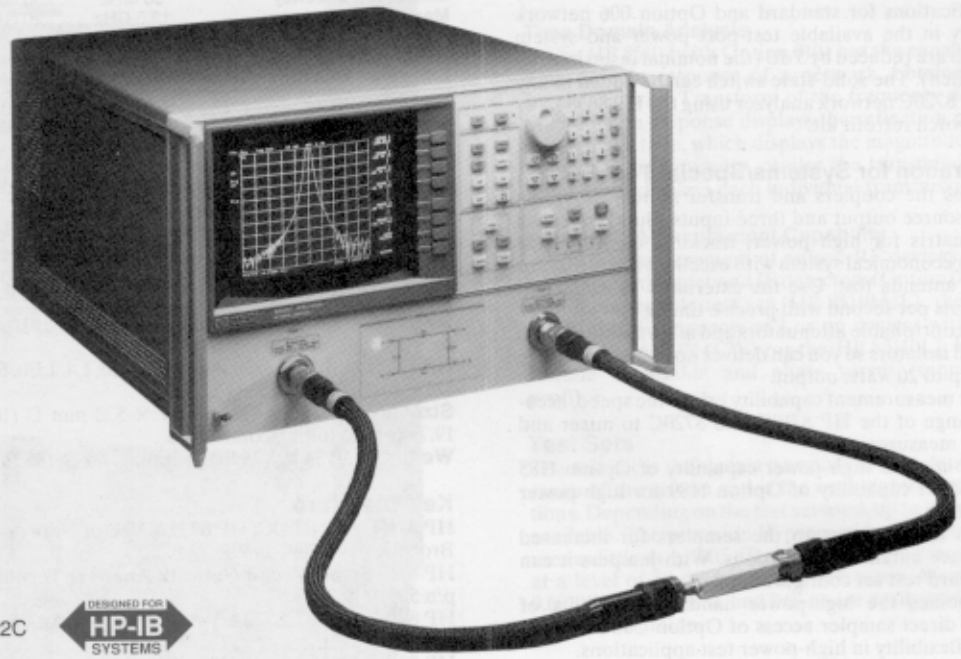
NETWORK ANALYZERS

Microwave Network Analyzers, 50 MHz to 40 GHz

HP 8719C, 8720C, 8722C, 85014C, 85162A

- 50 MHz to 13.5, 20, or 40 GHz frequency range
- Fast-sweeping built-in synthesized source
- Integrated switching S-parameter test set
- Vector receiver, error correction, time domain
- Direct save/recall to an external disk drive
- Up to 103 dB dynamic range



HP 8722C

DESIGNED FOR HP-IB SYSTEMS

HP 8720 Series Network Analyzers

The HP 8719C, 8720C, and 8722C vector network analyzers characterize RF and microwave components down to 50 MHz and up to 40 GHz. These network analyzers include a fast-sweeping source, S-parameter test set, tuned receiver, and large color display in a single package. Their integrated design makes the HP 8720 series compact, economical, and easy to use. They are ideal choices for cost- and space-conscious engineers in research and development, manufacturing, incoming inspection, or quality assurance.

Affordable Analyzers with Excellent Performance

Despite their affordable price, the HP 8720 series network analyzers offer remarkable performance. The integrated source is fully synthesized, even while sweeping, and provides stability and accuracy within 10 ppm (typical). Yet the sweep rate is extremely fast: measurement update times are typically about 1 ms per point. Frequency resolution is 100 kHz standard; Option 001 provides 1 Hz resolution for narrowband or long-delay devices.

The tuned receivers with variable-bandwidth IF filters provide up to 103 dB of dynamic range. A built-in switching test set measures all four S-parameters (both forward and reverse) with a single connection.

Two independent channels can simultaneously display two measurements, such as reflection and transmission responses. The receiver detects both magnitude and phase, and displays results in a variety of useful formats, including group delay, deviation from linear phase, complex impedance, and SWR—on rectangular, polar, or Smith charts.

Built-in vector accuracy enhancement provides excellent error-corrected accuracy in all common coaxial connectors. A user kit supports user-defined standards, and allows calibration in waveguide (including effects of dispersion). Choose from a simple response normalization to full two-port error correction. Or use TRL* to measure noncoaxial devices (e.g. microstrip) in a fixture. In addition, the frequency subset feature lets you zoom in on a response without recalibrating.

Powerful Features for Active Devices

With +10 dBm at their test ports, the HP 8719C and 8720C have plenty of power for testing amplifiers. For sensitive small-signal devices, the built-in step attenuator can cut power back to −65 dBm. Absolute power levels can be set accurately anywhere in the system, using the power meter calibration feature. Power-sweep capability and power resolution of 0.1 dB make it easy to test the gain-compression characteristics of active components. In addition, there are two internal tees for biasing transistors through the test ports.

In-Fixture Device Characterization

Use TRL* calibration to minimize fixture errors, which would otherwise dominate the measurement of noncoaxial devices (such as microstrip). Or combine the network analyzer with a wafer-probing station in order to measure devices while still on the wafer. Electronic port extensions and gating are also available to enhance accuracy.

Time Domain and Fault Location

Time domain capability (Option 010) computes and displays the response versus time or distance (instead of frequency) of the device under test (DUT). Use time domain to locate and quantify individual faults or discontinuities in a network. Apply the gating feature to remove the effects of unwanted reflections (separated in time), then view the DUT's true response versus frequency.

Time-Saving Productivity Features

Limit-test capability makes pass/fail decisions quantitative and decisive. Define up to 22 test limits per channel, based on the specifications of your components. Tuning is faster, and testing is more consistent.

To document results without a computer, the copy feature sends the entire display to a compatible plotter or printer. A built-in buffer controls the peripheral while you continue with the next measurement.

Annotate specific trace features with markers — up to five per channel, all displayed at once. Advanced marker functions track a maximum or minimum point (while tuning), or compute the delta between two markers. For bandpass filters, markers automatically calculate center frequency, bandwidth, and Q.

With save/recall capability, you can define and then save test configurations, then recall identical conditions later, and align or test each DUT consistently. Use five internal nonvolatile memory registers, or save/recall directly to an external CS80 disk drive.

NETWORK ANALYZERS

Microwave Network Analyzers, 50 MHz to 40 GHz (cont'd)

HP 8719C, 8720C, 8722C, 85014C, 85162A

Solid-State Switching

Solid-state switching (Option 006) allows simultaneous measurement of forward and reverse parameters and continuous update of all four S-parameters as required for two-port error correction. Option 006, available on the HP 8719C and 8720C, replaces the standard mechanical test-port switch with a solid-state switch. HP 8719C and 8720C system specifications for standard and Option 006 network analyzers differ only in the available test-port power and system dynamic range, which are reduced by 5 dB (the nominal insertion loss of the solid-state switch). The solid-state switch can be added to any existing HP 8719C or 8720C network analyzer using the HP 86384A or 86384B solid-state switch retrofit kit.

Flexible Configuration for Systems/Special Test Sets

Option 011 deletes the couplers and transfer switch, providing direct access to the source output and three inputs. Build your own test set or switch matrix for high power, tracking, or multi-port devices. Or create an economical system with excellent sensitivity for RCS and near-field antenna test. Use the external TTL trigger to acquire over 200 points per second with precise timing.

Option H85 adds controllable attenuators and allows addition of a booster amplifier and isolators so you can deliver up to 20 watts to the DUT and measure up to 20 watts output.

Option H89 mixer measurement capability brings the speed, accuracy and dynamic range of the HP 8719C and 8720C to mixer and frequency translator measurements.

Option H87 combines the high-power capability of Option H85 and the frequency-offset capability of Option H89 for high-power mixer measurements.

Option C02 gives direct access to the samplers for increased sensitivity in free-space antenna applications. With jumpers it can also operate in standard test set configuration.

Option H88 combines the high-power handling capability of Option H85 and the direct sampler access of Option C02 for maximum sensitivity and flexibility in high-power test applications.

Contact HP for technical specifications and information about additional special test sets.

Accessories

Configure a complete measurement system with test port cables, calibration kits, verification kits, and adapters. Waveguide calibration kits are available in X, P (Ku), K, and R (Ka) bands, covering 8.2 to 40 GHz. The HP 8720 family network analyzers use the same precision calibration standards and rugged flexible cables as the industry-standard HP 8510.

Software Enhances Measurement Capability

Automate these network analyzers with a desktop computer via HP-IB. The HP 85162A measurement automation software guides you through measurements and simplifies test configurations. With the HP 85014C active device measurement software, you can measure transistors quickly and completely. This software includes models to de-embed the HP 85041A transistor fixture, and also controls the bias supply.

Measure the dielectric properties of materials quickly and nondestructively with the HP 85070A dielectric probe kit (including software). For greater accuracy and flexibility, use the HP 85071A materials measurement software, for samples loaded into waveguide or coaxial fixtures.

Specifications Summary

Data applies at 23° ± 3° C. See product literature for total measurement uncertainty after error correction.

	HP 8719C	HP 8720C	HP 8722C
Minimum frequency	50 MHz	50 MHz	50 MHz
Maximum frequency	13.5 GHz	20 GHz	40 GHz
Frequency resolution (std)	100 kHz	100 kHz	100 kHz
With Opt 001	1 Hz	1 Hz	1 Hz
Frequency accuracy	10 ppm	10 ppm	10 ppm
Maximum power	+10 dBm	+10 dBm	−5 dBm
Minimum power	−65 dBm	−65 dBm	−60 dBm
Power resolution	0.05 dB	0.05 dB	0.05 dB
Power flatness	±2.0 dB	±2.0 dB	±3.0 dB
Power sweep range	20 dB	20 dB	15 dB
Receiver sensitivity (>2 GHz)	−93 dBm	−93 dBm	−91 dBm
With Opt 011	−113 dBm	−113 dBm	−113 dBm
System dynamic range (>2 GHz)	103 dB	103 dB	87 dB
Test port connector	3.5 mm	3.5 mm	2.4 mm

Measurement Rate (typical, 201-point sweep): <2 ms/point (1-por to <5 ms/point (full 2-port)

HP-IB Functions: SH1, AH1, T6, TE0, L4, LE0, SR1, RL1, PP0, DC DT0, C0, C1, C10, E2

Size: 267 mm H × 425 mm W × 533 mm D (10.5 in × 16.75 in 19.75 in), excluding connectors

Weight: Net, 34 kg (75 lb); shipping, 40 kg (88 lb)

Key Literature

HP 8719C, HP 8720C, HP 8722A Vector Network Analyzers Brochure, p/n 5091-1939E.

HP 8719/8720C Vector Network Analyzer Technical Data, p/n 5091-5191E.

HP 8719C, 8720C, 8722A Vector Network Analyzer Ordering Guid p/n 5091-5222E.

HP 8719/8720C Option H89 Mixer Measurement Technical Data, p/n 5091-7915E.

Ordering Information

		Pric
HP 8719C Network Analyzer (50 MHz to 13.5 GHz)		$46,4
HP 8720C Network Analyzer (50 MHz to 20 GHz)		$59,6
HP 8722C Network Analyzer (50 MHz to 40 GHz)		$76,5
The following options apply to all three network analyzers:		
Opt 001 1 Hz Frequency Resolution		+$9,6
Opt 010 Time Domain Capability		+$9,1
Opt 011 Direct-Access Receiver Configuration		−$4,0
Opt 802 Add HP 9122C Dual Disk Drive		+$1,7
Opt 913 Rack Mount Kit (5062-4071)		+$
Opt W31 On-Site Service (see page 663)	HP 8719C	$1,5
	HP 8720C	$1,8
	HP 8722C	$4,4
Opt W32 Calibration Service (see page 663)	HP 8719C	$5
	HP 8720C	$7
	HP 8722C	$5
Opt C02 Direct Sampler Access		$2,5
Opt H85 High-Power Handling Capability		$12,0
Opt H88 High-Power Direct Sampler Access		$14,5
The following option applies only to the HP 8719C and 8720C network analyzers:		
Opt 006 Solid-State Switching Test Set		+$3,5
Opt H87 High-Power Mixer Test Set		$13,0
Opt H89 Mixer Test Set		$3,5
The following option applies only to the HP 8722C network analyzer:		
Opt 003 High Forward (S21) Dynamic Range		$
HP 85014C Active Device Measurement Software (see page 334)		
HP 85162A Measurement Automation Software		$1,5
HP 86384A Solid-State Switch Retrofit Kit (for HP 8719C)		$3,5
HP 86384B Solid-State Switch Retrofit Kit (for HP 8720C)		$3,5