Agilent 8719D, 8720D, and 8722D Network Analyzers

Configuration Guide

8719D, 50 MHz to 13.5 GHz
8720D, 50 MHz to 20 GHz
8722D, 50 MHz to 40 GHz

The Agilent Technologies 8720D family of microwave network analyzers integrates a microwave source, tuned-receiver, and S-parameter test set into a single, cost-effective instrument. To complete a microwave measurement system, select the desired network analyzer options, test port cables, and calibration kits. Also, additional measurement accessories may be selected.

Standard network analyzers

8719D vector network analyzer, 50 MHz to 13.5 GHz
8720D vector network analyzer, 50 MHz to 20 GHz
8722D vector network analyzer, 50 MHz to 40 GHz

Included with a standard network analyzer is an installation and quick start guide, a user's guide, a quick-reference guide, a programmer's guide and example programs disk, a bandpass filter test device (P/N 0955-0446), and a 3-year return-to-Agilent service warranty.

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Network analyzer options

Analyzer options

- ☐ **1D5** high-stability frequency reference: replaces standard frequency reference with a higher stability unit
- ☐ **007** mechanical transfer switch: replaces the solid-state transfer switch with a mechanical transfer switch. Increases test port power and dynamic range by 5 dB
- ☐ **010** time-domain capability: allows time-domain measurements
- ☐ **012** direct sampler access: configures the test set with direct access to A and B sampler receiver inputs. Operates as a standard instrument with the jumpers installed
- ☐ **085** high-power S-parameter test set modification: deletes bias tees and adds a mechanical transfer switch and internal attenuators. Allows insertion of an amplifier before the transfer switch and insertion of isolators in the measurement configuration
- ☐ **089** frequency offset mode: modifies the test set and firmware. Provides mixer measurement capability, allowing a receiver frequency offset from the source
- ☐ **400** adds fourth sampler and TRL calibration firmware: replaces the transfer switch with a solid-state switch/splitter

Hardware options

- ☐ **1CM** adds rack mount flange kit for use without handles
- ☐ **1CP** adds rack mount flange kit for use with handles[1]

Information options

- ☐ **0BW** adds service guide (08720-90292)
- ☐ **0B0** deletes all user and programming guides
- ☐ **AV8** adds extra user and programming guides (08720-90288, 08720-90293)
- ☐ **ABF** adds French quick reference guide (08720-90283)
- ☐ **ABJ** adds Japanese quick reference guide (08720-90285)

Service options

- ☐ **0Q8** includes factory-delivered service training
- ☐ **W01** converts three year return-to-Agilent repair warranty to a one year on-site repair warranty[2]
- ☐ **W32** adds three years of return-to-Agilent calibration
- ☐ **W34** adds three years of return-to-Agilent standards-compliant calibration
- ☐ **W52** adds five years of return-to-Agilent calibration
- ☐ **W54** adds five years of return-to-Agilent standards-compliant calibration

Certification options

- ☐ **1BN** mil standard 45662A calibration certification
- ☐ **1BP** mil standard 45662A calibration certification with test data

Network analyzer option compatibility

Option	Option 1D5	Option 007	Option 010	Option 012	Option 085	Option 089	Option 400
1D5 High-Stability Frequency Reference	—	Yes	Yes	Yes	Yes	Yes	Yes
007 Mechanical Transfer Switch	Yes	—	Yes	Yes	No[5]	Yes	No[3]
010 Time Domain	Yes	Yes	—	Yes	Yes	Yes	Yes
012 Direct Sampler Access	Yes	Yes	Yes	—	Yes	Yes	Yes
085 High-Power Test	Yes	No[4]	Yes	Yes	—	Yes	No[3, 4]
089 Frequency Offset Mode	Yes	Yes	Yes	Yes	Yes	—	Yes
400 Four-Sampler Test Set	Yes	No[3]	Yes	Yes	No[3, 4]	Yes	—

1. The 8719D/8720D/8722D is supplied with handles.
2. Only where available.
3. Option 400 uses solid-state switch splitter in place of transfer switch.
4. Option 085 requires and includes a mechanical transfer switch.
5. Applies only at time of purchase.

Measurement accessories

Accessories are available in these connector types: 7 mm, K connector® (2.92 mm), Type-N, 3.5 mm (SMA-compatible), 2.4 mm coaxial, WR-90 (X Band), WR-62 (P Band), WR-42 (K Band), WR-28 (R Band)

For a complete list of Agilent's coaxial and waveguide accessories, ask your Agilent Technologies sales representative for the Coaxial and Waveguide Test Accessories Catalog (literature number 5091-4269E).

Calibration kits

Coaxial measurements

For coaxial measurements, Agilent offers two types of calibration kits:

Economy, includes:

- open standards (male and female)
- short standards (male and female)
- fixed-termination standards (male and female)
- in-series adapters

Standard, includes the devices in the economy kit and adds:

- sliding loads
- connector gages

Precision, includes the devices in the economy kit and adds:

- 50 ohm airline for TRL calibration
- TRL adapters
- connector tools

Waveguide measurements

For waveguide measurements, Agilent offers calibration kits that include:

- waveguide-to-coax adapters (X, P, K)
- precision waveguide section
- flush short circuit
- fixed terminations
- straight section

Electronic calibration

Agilent also offers electronic calibration systems. This system requires a control unit and electronic calibration kit. The calibration kit includes:

- highband ECal module
- torque wrench
- optional adapters
- optional lowband ECal module

Verification kits

All Agilent verification kits include:

- precision Z_0 airline
- mismatched airline
- fixed attenuators
- traceable measured data and uncertainties

Cables and adapter sets

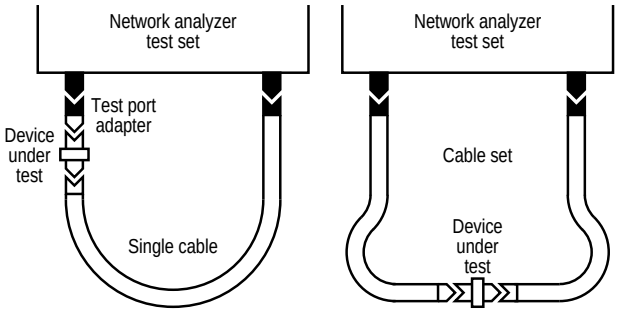
Agilent offers cables in the following types:

- single cables in semi-rigid and flexible
- cable set in semi-rigid and flexible

There are also adapter sets available that protect the test port and convert the port to the desired connector interface. These kits contain:

- one male adapter
- one female adapter

To attain the best mechanical rigidity for device connection, use a single cable and the appropriate special adapter set. To attain the greatest flexibility for device connection, use a cable set.



For devices with 3.5 mm or SMA connectors

Calibration kits

☐ **85052B** standard: 0.045 to 26.5 GHz. Includes:
- 00902-60003 3.5 mm (m) fixed load
- 00902-60004 3.5 mm (f) fixed load
- 00911-60019 3.5 mm (m) sliding load
- 00911-60020 3.5 mm (f) sliding load
- 85052-60006 3.5 mm (m) short
- 85052-60007 3.5 mm (f) short
- 85052-60008 3.5 mm (m) open
- 85052-60009 3.5 mm (f) open
- 85052-60012 3.5 mm (f) to 3.5 mm (f) adapter
- 85052-60013 3.5 mm (f) to 3.5 mm (m) adapter
- 85052-60014 3.5 mm (m) to 3.5 mm (m) adapter

☐ **85052B** Option K11 PSC-3.5 slotless female center contact repair kit

☐ **85052C**[1] precision TRL: 0.045 to 26.5 GHz. Includes:
- 00902-60003 3.5 mm (m) fixed load
- 00902-60004 3.5 mm (f) fixed load
- 85052-60006 3.5 mm (m) short
- 85052-60007 3.5 mm (f) short
- 85052-60008 3.5 mm (m) open
- 85052-60009 3.5 mm (f) open
- 85052-60032 3.5 mm (f) to 3.5 mm (f) adapter
- 85052-60033 3.5 mm (m) to 3.5 mm (m) adapter
- 85052-60034 3.5 mm (f) to 3.5 mm (m) adapter
- 85052-60035 3.5 mm short TRL line
- 85052-60036 3.5 mm long TRL line

☐ **85052D** economy: 0.045 to 26.5 GHz. Includes:
- 00902-60003 3.5 mm (m) fixed load
- 00902-60004 3.5 mm (f) fixed load
- 85052-60006 3.5 mm (m) short
- 85052-60007 3.5 mm (f) short
- 85052-60008 3.5 mm (m) open
- 85052-60009 3.5 mm (f) open
- 85052-60012 3.5 mm (f) to 3.5 mm (f) adapter
- 85052-60013 3.5 mm (f) to 3.5 mm (m) adapter
- 85052-60014 3.5 mm (m) to 3.5 mm (m) adapter

☐ **85033D** economy: DC to 6 GHz. Includes:
- 1250-1746 3.5 mm (f) to APC-7 adapter
- 1250-1747 3.5 mm (m) to APC-7 adapter
- 85033-60009 3.5 mm (m) load
- 85033-60010 3.5 mm (f) load
- 85033-60011 3.5 mm (m) open
- 85033-60012 3.5 mm (f) open
- 85033-60013 3.5 mm (m) short
- 85033-60014 3.5 mm (f) short

☐ **85093A RF ECal:**[2] 30 kHz to 6 GHz. Includes:
85093-60001 3.5 mm(f) to 3.5 mm(m) RF ECal module
- ☐ **Option 00M** substitutes:
  85093-60002 3.5 mm(m) to 3.5 mm(m) RF ECal module
- ☐ **Option 00F** substitutes:
  85093-60003 3.5 mm(f) to 3.5 mm(f) RF ECal module
- ☐ **Option 00A** adds:
  85052-60012 3.5 mm(f) to 3.5 mm(f) adapter
  85052-60014 3.5 mm(m) to 3.5 mm(m) adapter

☐ **85062B MW ECal:**[2] 1 GHz to 26.5 GHz. Includes:
85062-60002 3.5 mm(f) to 3.5 mm(m) MW ECal module
- ☐ **Option 00M** substitutes:
  85062-60004 3.5 mm(m) to 3.5 mm(m) MW ECal module
- ☐ **Option 00F** substitutes:
  85062-60006 3.5 mm(f) to 3.5 mm(f) MW ECal module
- ☐ **Option 001** adds a 30 kHz to 6 GHz RF ECal module
  85093-60001 3.5 mm(f) to 3.5 mm(m) RF ECal module
- ☐ **Option 00A** adds:
  85052-60012 3.5 mm(f) to 3.5 mm(f) adapter
  85052-60014 3.5 mm(m) to 3.5 mm(m) adapter

1. Kit includes open and short circuits, fixed broadband loads, precision short airlines, TRL adapters and 3.5 mm connector tools.
2. Requires an Agilent 85097A PC interface kit.

Verification kits

☐ **85053B** 0.045 to 26.5 GHz
  ☐ **Option 1BP** MIL-STD 45662A calibration certificate with test data

Cables for either 8719D or 8720D

☐ **85131C** single, semi-rigid: 3.5 mm to 3.5 mm, 81 cm, 32 in.
☐ **85131D** set, semi-rigid: 3.5 mm to 3.5 mm, 53 cm each, 21 in.
☐ **85131E** single, flexible: 3.5 mm to 3.5 mm, 96 cm, 38 in.
☐ **85131F** set, flexible: 3.5 mm to 3.5 mm, 53 cm each, 21 in.

Cables for the 8722D

☐ **85134C** single, semi-rigid: 3.5 mm to 2.4 mm, 81 cm, 32 in.
☐ **85134D** set, semi-rigid: 3.5 mm to 2.4 mm, 53 cm each, 21 in.
☐ **85134E** single, flexible: 3.5 mm to 2.4 mm, 96 cm, 38 in.
☐ **85134F** set, flexible: 3.5 mm to 2.4 mm, 53 cm each, 21 in.

Adapter sets

☐ **85130D** 8719D/20D only: 3.5 mm[1] to 3.5 mm
☐ **85130F** 8722D only: 2.4 mm[1] to 3.5 mm

For devices with 7-mm connectors

Calibration kits

☐ **85050B** standard: 0.045 to 18 GHz. Includes:
  00909-60008 7 mm coax termination
  85050-60006 7 mm fixed broadband load
  85050-80007 7 mm short
  85050-80010 7 mm open
  85050-80011 7 mm sliding load
☐ **85050C**[2] precision TRL: 0.045 to 18 GHz. Includes:
  00909-60008 7 mm coax termination
  85050-60003 7 mm to 7 mm airline
  85050-60005 7 mm to 7 mm TRL adapter
  85050-60006 7 mm fixed broadband load
  85050-80007 pin collet assembly
  85050-80008 7 mm short
  85050-80009 7 mm short collet
  85050-80010 7 mm open
☐ **85050D** economy: 0.045 to 18 GHz. Includes:
  85050-60006 7 mm fixed broadband load
  85050-80007 7 mm short
  85050-80010 7 mm open
☐ **85031B** economy: 30 kHz to 6 GHz. Includes:
  00909-60008 7 mm coax termination
  85050-60001 7 mm open/short

Electronic calibration kits

☐ **85091A RF ECal:**[3] 30 kHz to 6 GHz. Includes:
  85091-60001 7 mm to 7 mm RF ECal module
☐ **85060B MW ECal:**[3] 1 GHz to 18 GHz. Includes:
  85060-60002 7 mm to 7 mm MW ECal module
  ☐ **Option 001**: adds a 30 kHz to 6 GHz RF ECal module
  85091-60001 7 mm to 7 mm RF ECal module

Verification kit

☐ **85051B** 8719D/20D only: 0.045 to 18 GHz
  ☐ **Option 1BP** MIL-STD 45662A calibration certificate with test data

Cables for either 8719D or 8720D

☐ **85132C** single, semi-rigid: 7 mm to 3.5 mm, 81 cm, 32 in.
☐ **85132D** set, semi-rigid: 7 mm to 3.5 mm, 53 cm each, 21 in.
☐ **85132E** single, flexible: 7 mm to 3.5 mm, 96 cm, 38 in.
☐ **85132F** set, flexible: 7 mm to 3.5 mm, 53 cm each, 21 in.

Cables for the 8722D

☐ **85135C** single, semi-rigid: 7 mm to 2.4 mm, 81 cm, 32 in.
☐ **85135D** set, semi-rigid: 7 mm to 2.4 mm, 53 cm each, 21 in.
☐ **85135E** single, flexible: 7 mm to 2.4 mm, 96 cm, 38 in.
☐ **85135F** set, flexible: 7 mm to 2.4 mm, 53 cm each, 21 in.

Adapter sets

☐ **85130B** 8719D/20D only: 3.5 mm[1] to 7 mm
☐ **85130E** 8722D only: 2.4 mm[1] to 7 mm

1. Special rugged female connector specifically for connecting to the network analyzer test port, but does not mate with a standard male connector.
2. Kit includes open and short circuits, fixed loads, precision short airline, 7 mm connector tools and gauges.
3. Requires an Agilent 85097A PC interface kit.

For devices with Type-N connectors

Calibration kits

☐ **85054B** standard: 0.045 to 18 GHz. Includes:
- 00909-60011 Type-N (m) fixed lowband load
- 00909-60012 Type-N (f) fixed lowband load
- 85054-60025 Type-N (m) short
- 85054-60026 Type-N (f) short
- 85054-60027 Type-N (m) open
- 85054-60028 Type-N (f) open
- 85054-60031 Type-N (f) to 7 mm adapter
- 85054-60032 Type-N (m) to 7 mm adapter
- 85054-60037 Type-N (f) to Type-N (f) adapter
- 85054-60038 Type-N (m) to Type-N (m) adapter
- 85054-80010 Type-N (f) sliding load
- 85054-80009 Type-N (m) sliding load
- 85054-60050 Type-N (f) connector gage
- 85054-60052 Type-N (f) gage master
- 85054-60051 Type-N (m) connector gage
- 85054-60053 Type-N (m) gage master

☐ **85054B** Option K11 PSC-N slotless contact repair kit

☐ **85054D** economy: 0.045 to 18 GHz. Includes:
- 85054-60025 Type-N (m) short
- 85054-60026 Type-N (f) short
- 85054-60027 Type-N (m) open
- 85054-60028 Type-N (f) open
- 85054-60031 Type-N (f) to 7 mm adapter
- 85054-60032 Type-N (m) to 7 mm adapter
- 85054-60037 Type-N (f) to Type-N (f) adapter
- 85054-60038 Type-N (m) to Type-N (m) adapter
- 85054-60046 Type-N (m) fixed load
- 85054-60047 Type-N (f) fixed load

☐ **85036B** 75 ohm: DC to 3 GHz. Includes:
- 00909-60019 Type-N (m) fixed 75 ohm load
- 00909-60020 Type-N (f) fixed 75 ohm load
- 85032-20001 Type-N (f) open
- 85036-60007 Type-N (m) open
- 85036-60011 Type-N (f) 75 ohm short
- 85036-60012 Type-N (m) 75 ohm short
- 85036-60013 Type-N (m) to Type-N (m) 75 ohm adapter
- 85036-60014 Type-N (f) to Type-N (f) 75 ohm adapter
- 85036-60015 Type-N (m) to Type-N (f) 75 ohm adapter

☐ **85036E** 75 ohm: Type-N. Includes:
- 00909-60019 Type-N (m) fixed 75 ohm load
- 85036-60016 Type-N (m) fixed 75 ohm open/short

Electronic calibration kits

☐ **85092A RF ECal:**[1] 30 kHz to 6 GHz. Includes:
85092-60001 Type-N (f) to Type-N(m) RF ECal module
- ☐ **Option 00M** substitutes:
  85092-60002 Type-N(m) to Type-N(m) RF ECal module
- ☐ **Option 00F** substitutes:
  85092-60003 Type-N(f) to Type-N(f) RF ECal module
- ☐ **Option 00A** adds:
  85054-60037 Type-N(f) to Type-N(f) adapter
  85054-60038 Type-N(m) to Type-N(m) adapter

☐ **85064B MW ECal:**[1] 1 GHz to 18 GHz. Includes:
85064-60002 Type-N(f) to Type-N(m) MW ECal module
- ☐ **Option 00M** substitutes:
  85064-60004 Type-N(m) to Type-N(m) MW ECal module
- ☐ **Option 00F** substitutes:
  85064-60006 Type-N(f) to Type-N(f) MW ECal module
- ☐ **Option 001** adds a 30 kHz to 6 GHz RF ECal module
  85092-60001 Type-N(f) to Type-N(m) RF ECal module
- ☐ **Option 00A** adds:
  85054-60037 Type-N(f) to Type-N(f) adapter
  85054-60038 Type-N(m) to Type-N(m) adapter

Verification kit

☐ **85055A** 8719D/8720D only: 0.045 to 18 GHz
- ☐ **Option 1BP** MIL-STD 45662A calibration certificate with test data

Cables

Use the test port cables recommended for devices with 7 mm connectors, and 7 mm to Type-N adapters that are from the 85054B/D Type-N calibration kit. (See 7 mm connector section)

Adapter set

☐ **85130C** 8719D/20D only: 3.5 mm[2] to Type-N

1. Requires an 85097A PC interface kit.
2. This kit can be used to calibrate in the 2.4 mm interface, as well as measure in the 2.92 mm (K connector).

For devices with 2.4-mm connectors

Calibration kits

☐ **85056A** standard: 0.045 to 50 GHz. Includes:
- 00901-60003 2.4 mm (m) fixed broadband load
- 00901-60004 2.4 mm (f) fixed broadband load
- 00915-60003 2.4 mm (m) sliding load
- 00915-60004 2.4 mm (f) sliding load
- 85056-60005 2.4 mm (m) to 2.4 mm (m) adapter
- 85056-60006 2.4 mm (f) to 2.4 mm (f) adapter
- 85056-60007 2.4 mm (m) to 2.4 mm (f) adapter
- 85056-60020 2.4 mm (m) short
- 85056-60021 2.4 mm (f) short
- 85056-60022 2.4 mm (m) open
- 85056-60023 2.4 mm (f) open

☐ **85056D** economy: 0.045 to 50 GHz. Includes:
- 00901-60003 2.4 mm (m) fixed broadband load
- 00901-60004 2.4 mm (f) fixed broadband load
- 85056-60005 2.4 mm (m) to 2.4 mm (m) adapter
- 85056-60006 2.4 mm (f) to 2.4 mm (f) adapter
- 85056-60007 2.4 mm (m) to 2.4 mm (f) adapter
- 85056-60020 2.4 mm (m) short
- 85056-60021 2.4 mm (f) short
- 85056-60022 2.4 mm (m) open
- 85056-60023 2.4 mm (f) open

Verification kit

☐ **85057B** 8722D only: 0.045 to 50 GHz
- ☐ **Option 1BP** MIL-STD 45662A calibration certificate with test data

Cables for the 8722D

☐ **85133C** single, semi-rigid: 2.4 mm, 81 cm, 32 in.
☐ **85133D** set, semi-rigid: 2.4 mm, 53 cm each, 21 in.
☐ **85133E** single, flexible: 2.4 mm, 81 cm, 32 in.
☐ **85133F** set, flexible: 2.4 mm, 53 cm each, 21 in.

Adapter set

☐ **85130G** 8722D only: 2.4 mm[1] to 2.4 mm

For devices with K connectors (2.92 mm)

Calibration kit

☐ **85056K**[2] economy, 2.92/2.4 mm: 0.045 to 40 GHz. Includes:
- 00901-60003 2.4 mm (m) fixed broadband load
- 00901-60004 2.4 mm (f) fixed broadband load
- 00915-60003 2.4 mm (m) sliding load
- 00915-60004 2.4 mm (f) sliding load
- 11904-60001 2.4 mm (m) to 2.92 mm (m) adapter
- 11904-60002 2.4 mm (f) to 2.92 mm (f) adapter
- 11904-60003 2.4 mm (m) to 2.92 mm (f) adapter
- 11904-60004 2.4 mm (f) to 2.92 mm (m) adapter
- 85056-60005 2.4 mm (m) to 2.4 mm (m) adapter
- 85056-60006 2.4 mm (f) to 2.4 mm (f) adapter
- 85056-60007 2.4 mm (m) to 2.4 mm (f) adapter
- 85056-60020 2.4 mm (m) short
- 85056-60021 2.4 mm (f) short
- 85056-60022 2.4 mm (m) open
- 85056-60023 2.4 mm (f) open
  - ☐ **Option 001** adds 2.4 mm sliding loads and gages

Cables[3]

☐ **85133C** single, semi-rigid: 2.4 mm, 81 cm, 32 in.
☐ **85133D** set, semi-rigid: 2.4 mm, 53 cm each, 21 in.
☐ **85133E** single, flexible: 2.4 mm, 81 cm, 32 in.
☐ **85133F** set, flexible: 2.4 mm, 53 cm each, 21 in.

Adapters

☐ **11904A** 2.4 mm[1] to K (m)
☐ **11904B** 2.4 mm[1] to K (f)
☐ **11904C** 2.4 mm[1] to K (f)
☐ **11904D** 2.4 mm[1] to K (m)
☐ **11904S** 2.4 mm[1] to K adapter set

1. Special rugged female connector specifically for connecting to the network analyzer test port, but does not mate with a standard male connector
2. This kit can be used to calibrate in the 2.4 mm interface, as well as measure in the 2.92 mm (K connector).
3. 2.4 mm to K type adapters are required in addition to these cables.

For devices with waveguide

X Band

- ☐ **X11644A** calibration kit (standard, WR-90, 8.2 to 12.4 GHz). Includes:
  - 00896-60008 X-band standard section
  - 00910-60003 X-band termination
  - 11644-20018 X-band short
  - 11644-20021 X-band shim (open)
  - X281C waveguide to 7 mm coax adapter
- ☐ **8719D/20D, 85132F** cable set (set, flexible, 7 to 3.5 mm, 53 cm each, 21 in.)
- ☐ **8722D, 85135F** cable set (set, flexible, 7 to 2.4 mm, 53 cm each, 21 in.)
- ☐ **X281C** adapter (included in calibration kit): WR-90 to 7 mm

P Band

- ☐ **P11644A** calibration kit (standard, WR-62, 12.4 to 18 GHz). Includes:
  - 00896-60007 P-band standard section
  - 00910-60002 P-band termination
  - 11644-20017 P-band short
  - 11644-20020 P-band shim (open)
  - P281C waveguide to 7 mm coax adapter
- ☐ **8719D/20D, 85132F** cable set (flexible, 7 to 3.5 mm, 53 cm each, 21 in.)
- ☐ **8722D, 85135F** cable set (flexible, 7 to 2.4 mm, 53 cm each, 21 in.)
- ☐ **P281C** adapter (included in calibration kit): WR-62 to 7 mm

K Band

- ☐ **K11644A** calibration kit (standard, WR-42, 18 to 26.5 GHz). Includes:
  - 00896-60006 K-band standard section
  - 00910-60001 K-band termination
  - 11644-20016 K-band short
  - 11644-20019 K-band shim (open)
  - K281C waveguide to 3.5 mm (f) coax adapter
- ☐ **8719D/20D, 85131F** cable set (set, flexible, 3.5 to 3.5 mm, 53 cm each, 21 in.)
- ☐ **8722D, 85134F** cable set (set, flexible, 3.5 to 2.4 mm, 53 cm each, 21 in.)
- ☐ **K281C** adapter (included in calibration kit): WR-42 to 3.5 mm (f)
  - ☐ **Option 012** WR-42 to 3.5 mm (m)

R Band

- ☐ **R11644A** calibration kit (standard, WR-28, 26.5-40 GHz). Includes:
  - 00914-60028 R-band termination
  - 11644-20005 R-band short
  - 11644-20003 R-band shim (open)
  - 11644-60001 R-band 10 cm straight waveguide
  - 11644-60016 R-band 5 cm straight waveguide
- ☐ **8722D, 85133F** cable set (set, flexible, 2.4 mm, 53 cm each, 21 in.)
- ☐ **R281A** adapter (2.4 mm (f) to WR-28 waveguide adapter)
- ☐ **R281B** adapter (2.4 mm (m) to WR-28 waveguide adapter)

Test configuration accessories

Power meters[1]
- ☐ **437B** digital average
- ☐ **438A** dual channel

Power sensors
- ☐ **8481B** 10 MHz to 18 GHz, Type-N (m), 25 watt
- ☐ **8482B** 100 kHz to 4.2 GHz, Type-N (m), 25 watt
- ☐ **8485A** 50 MHz to 26.5 GHz, APC-3.5 mm (m), 100 mW
- ☐ **8481A** 10 MHz to 18 GHz, Type-N (m), 100 mW
- ☐ **8482A** 100 kHz to 4.2 GHz, Type-N (m), 100 mW
- ☐ **8483A** 100 kHz to 2 GHz, Type-N (m), 75 ohm, 100 mW
- ☐ **R8486A** 26 GHz to 40 GHz, waveguide flange UG-599/U, 100 mW
- ☐ **8487A** 50 MHz to 50 GHz, 2.4 mm (m), 100 mW

Power amplifiers[2]
- ☐ **83006A** 0.01 to 26.5 GHz, 20 dB gain, power out: +18 dBm to 10 GHz or +16 dBm to 20 GHz or +14 dBm to 26.5 GHz
- ☐ **83017A** 0.05 to 26.5 GHz, 25 dB gain, power out: +20 dBm to 20 GHz or +15 dBm to 26.5 GHz
- ☐ **83018A** 2 to 26.5 GHz, 27 dB gain to 20 GHz or 23 dB to 26.5 GHz, power out: +24 dBm to 20GHz or +21 dBm to 26.5 GHz
- ☐ **83020A** 2 to 26.5 GHz, 30 dB gain to 20 GHz or 27 dB to 26.5 GHz, power out: +30 dBm to 20 GHz or +26 dBm to 26.5 GHz
- ☐ **83050A** 2 to 50 GHz, 21 dB gain, power out: +20 dBm to 40 GHz or +17 dBm to 50 GHz
- ☐ **83051A** pre-amplifier, 0.045 to 50 GHz, 23 dB gain, power out: +12 dBm to 45 GHz or +10 dBm to 50 GHz

Couplers
- ☐ **87300B** coaxial: 1 to 20 GHz, SMA (f), 10 dB coupling
- ☐ **87300C** coaxial: 1 to 26.5 GHz, 3.5 mm (f), 13 dB coupling
- ☐ **87301D** coaxial: 1 to 40 GHz, 2.4 mm (f) or optional 2.92 mm (f), 13 dB coupling
- ☐ **87310B** coaxial: 1 to 18 GHz, SMA (f), 3 dB coupling
- ☐ **87310B** Option 020 coaxial: 1 to 26.5 GHz, SMA (f), 20 dB coupling
- ☐ **87301E** coaxial: 2 to 50 GHz, 2.4 mm (f), 10 dB coupling

Test fixtures
For TRL/LRM and TOSL calibration standards, microstrip adapters, and test fixtures, recommends ICM[3] Adjustable Test Fixture Mainframe Series TF-3000, which is compatible with the ICM TRL-3000 Series Calibration Kits.

- ☐ **85041A** transistor test fixture: 45 MHz to 18 GHz[4]
- ☐ **11608A** transistor fixture: DC to 12.4 GHz

Bias supplies[5]
- ☐ **6626A** precision DC power supply; 2 A, 50 V maximum
- ☐ **6629A** quad-out precision GPIB DC power supply
- ☐ **14852A** bias interconnect cable
- ☐ **4142B** modular DC source/monitor; 10 A, 200 V maximum

Bias networks[6]
- ☐ **11590B** 100 MHz to 12.4 GHz, Type-N, 0.5 A and 100 V maximum bias
  - ☐ **Option 001** 100 MHz to 18 GHz, 7 mm, 0.5 A and 100 V maximum bias
- ☐ **11612A** 45 MHz to 26.5 GHz, 3.5 mm (f), 0.5 A and 40 V maximum bias
  - ☐ **Option 001** 2 A maximum bias
- ☐ **11612B** 45 MHz to 50 GHz, 2.4 mm (f), 0.5 A maximum bias

System software
- ☐ **85070B** high-temperature dielectric probe kit[7]
  - ☐ **Option 300** BASIC; runs on BASIC 5.0 or higher, 3½-inch disk
- ☐ **85071B** materials measurement software[8] (MS-DOS®)
  - ☐ **Option 300** BASIC; runs on BASIC 5.0 or higher, 3½-inch disk
- ☐ **85014C** active device measurement software[9]
- ☐ **85190A** IC-CAP modeling suite[10]
- ☐ **Design Software,** Advanced Design System series (ADS) and series IV8 connector repair kits

Application support
- ☐ **50629A** system startup assistance; provides one-half day (4 hours) of on-site assistance for initial instrument/system startup. Includes travel charges through Zone 4.

1. A power meter with the appropriate 8480-series power sensor is required for use with the power meter calibration feature.
2. RF connectors: 3.5 mm (f) on RF input and output; BNC (f) detector out 2.4 mm (f) on RF input and output for 85050A, 83051A.
3. Inter-Continental Microwave, 1515 Wyatt Drive, Santa Clara, CA 95054-1524, Telephone: (408) 727-1596; Fax: (408) 727-0105
4. Must use with 85014C active device measurement software. Includes inserts for 0.070 inch and 0.100 inch stripline packaged transistors. Also order appropriate 7 mm calibration kit and cables.
5. For internally biasing with the 8719D/8720D/8722D.
6. For supplying DC bias externally from test sets. Internal bias networks have a current limit of 0.5 A.
7. Includes the dielectric probe, software on 3.5 inch disk, cables, port/cable adapters, switch, short circuit, mounting bracket, adapters, 50-ohm termination, stand, vials, and stoppers. Measures complex permitivity of materials. Standard software version runs on PC or PC-compatible MS-DOS® 3.20 or higher and Microsoft Windows, 3.0 or 3.1.
8. Measures complex permeability and permitivity of materials in a transmission line environment.
9. Controls biasing and data storage for FETs and BJTs. Requires BASIC 5.0 (or higher) and 2 Mbytes of RAM (3 1/2-inch disk).
10. Consult with an Agilent systems application engineer. The product you order will depend on the test environment.

Peripheral accessories

Printers

- ☐ **HP C3540A** DeskJet 1600C (parallel, color)[1]
- ☐ **HP C2655A** DeskJet Portable 340 (parallel, monochrome; color-capable)
- ☐ **HP C2642A** DeskJet 400 (parallel, monochrome; color-capable)
- ☐ **HP C3916A** LaserJet 5 (serial/parallel, monochrome)[2]

For a current list of compatible printers, consult our printer-compatibility guide on our website at www.agilent.com/find/pcg

Interface cables

- ☐ **10833A** GPIB cable: 1.0 m (3.3 ft.)
- ☐ **10833B** GPIB cable: 2.0 m (6.6 ft.)
- ☐ **10833D** GPIB cable: 0.5 m (1.6 ft.)
- ☐ **C2913A** RS-232C interface cable: 1.2 m (3.9 ft.)
- ☐ **C2914A** serial interface cable: 1.2 m (3.9 ft.)
- ☐ **24542G** RS232C F/M cable: 3 m (9.9 ft.)
- ☐ **24542D** RS-232C interface cable: 3 m (9.9 ft.)

Keyboard[3]

- ☐ **C1405B** Option ABA keyboard, also order adapter C1405-60015

Equipment racks

- ☐ **5063-9223** rack mount flange kit, for use with handles; includes handles[4]
- ☐ **5063-9236** rack mount kit, for use with handles; does not include handles. May be ordered as Option 1CP.
- ☐ **5063-9216** rack mount kit, for use without handles. May be ordered as Option 1CM.
- ☐ **5063-9229** front handle kit; includes handles only[4]
- ☐ **1181A** system testmobile, 3 ft. tall (see literature number 5091-1233E)
- ☐ **1540-1695** operating case
- ☐ **9211-2657** transit case

Computers

☐ Any computer configured with an GPIB interface card and software drivers

Monitors

☐ Any VGA-compatible monitor

1. This printer will also accept plot files.
2. HP LaserJet II and IV can also accept plot files.
3. The analyzer can accept most PC-AT-compatible keyboards with a standard DIN connector. Keyboards with a mini-DIN connector are compatible with the C1405-60015 adapter.
4. The 8719D/8720D/8722D is supplied with handles.

Upgrades

Network analyzer upgrade kits

- ☐ **8719DU** plus the upgrade option designations below for the 8719D
- ☐ **8720DU** plus the upgrade option designations below for the 8720D
- ☐ **8722DU** plus the upgrade option designations below for the 8722D

Upgrade kit options

- ☐ **000** performance upgrade kit for 8719D, 8720D, or 8722D's with operating system firmware below 7.xx. Adds new CPU and firmware, which offers up to 7X speed improvement. Includes installation at service center.
- ☐ **007** adds mechanical S-parameter transfer switch. Includes installation by service engineer at service center.
- ☐ **010** adds time domain capability. Includes installation by service engineer at customer site or service center.
- ☐ **012** modifies S-parameter test set for direct sampler access. Front panel jumpers also allow standard instrument operation. Includes installation by service engineer at service center.
- ☐ **020** for 8719D only. Adds 20 GHz operation. Includes installation by service engineer at service center.
- ☐ **040** for 8719D and 8720D only. Adds 40 GHz operation. Includes installation at factory.
- ☐ **085** modifies S-parameter test set for high power measurement capability. Includes installation by service engineer at service center.
- ☐ **089** modifies S-parameter test set and firmware for frequency offset mixer test capability. Includes installation by service engineer at service center.
- ☐ **1D5** adds high stability time base. Includes installation by service engineer at service center.
- ☐ **400** adds fourth sampler and TRL calibration firmware. Includes installation by service engineer at service center.

Literature and documents

Part Number	Pub. Number
☐ **Application note 1217-1,** *Basics of Measuring the Dielectric Properties of Materials*	5091-3300E
☐ **Application note 1287-1,** *Understanding the Fundamental Principles of Vector Network Analysis*	5965-7707E
☐ **Application note 1287-2,** *Exploring the Architectures of Network Analyzers*	5965-7708E
☐ **Application note 1287-3,** *Applying Error Correction to Network Analyzer Measurements*	5965-7709E
☐ **Application note 1287-4,** *Network Analyzer Measurements: Filter and Amplifier Examples*	5965-7710E
☐ **Application note 1287-5,** *Improving Througut in Network Analyzer Applications*	5966-3317E
☐ **Application note 1287-6,** *Using a Network Analyzer to Characterize High-Power Components*	5966-3319E
☐ **Application note 1287-7,** *Improving Network Analyzer Measurements of Frequency-Translating Devices*	5966-3318E
☐ **Application note 1291-1,** *8 Hints for Making Better Network Analyzer Measurements*	5965-8166E
☐ **Product note 8510-8A,** *Applying TRL cal to non-coaxial measurements*	5091-3645E
☐ **Product note 8720-1,** *Testing Amplifiers and Active Devices with the Agilent 8720C*	5091-1942E
☐ **Product note 8720-2,** *In-Fixture Measurements with the Agilent 8720C*	5091-1943E
☐ **Product note 8753-2A,** *Mixer Measurements using the Agilent 8753 network analyzer*	5952-2771
☐ **8719D/8720D/8722D** *Installation and Quick Start Guide*	08720-90291
☐ **8719D/8720D/8722D** *Network Analyzer User's Guide*	08720-90288
☐ **8719D/8720D/8722D** *Network Analyzer Quick Reference Guide*	08720-90289
☐ **8719D/8720D/8722D** *Network Analyzer Programmer's Guide*	08720-90293
☐ **8719D/8720D/8722D** *Network Analyzer Service Guide*	08720-90292

Agilent Technologies' Test and Measurement Support, Services, and Assistance

Agilent Technologies aims to maximize the value you receive, while minimizing your risk and problems. We strive to ensure that you get the test and measurement capabilities you paid for and obtain the support you need. Our extensive support resources and services can help you choose the right Agilent products for your applications and apply them successfully. Every instrument and system we sell has a global warranty. Support is available for at least five years beyond the production life of the product. Two concepts underlie Agilent's overall support policy: "Our Promise" and "Your Advantage."

Our Promise

"Our Promise" means your Agilent test and measurement equipment will meet its advertised performance and functionality. When you are choosing new equipment, we will help you with product information, including realistic performance specifications and practical recommendations from experienced test engineers. When you use Agilent equipment, we can verify that it works properly, help with product operation, and provide basic measurement assistance for the use of specified capabilities, at no extra cost upon request. Many self-help tools are available.

Your Advantage

"Your Advantage" means that Agilent offers a wide range of additional expert test and measurement services, which you can purchase according to your unique technical and business needs. Solve problems efficiently and gain a competitive edge by contracting with us for calibration, extra-cost upgrades, out-of-warranty repairs, and on-site education and training, as well as design, system integration, project management, and other professional services. Experienced Agilent engineers and technicians worldwide can help you maximize your productivity, optimize the return on investment of your Agilent instruments and systems, and obtain dependable measurement accuracy for the life of those products.

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