

Agilent 8720E Family of Network Analyzers

Configuration Guide

8719ET, 50 MHz to 13.5 GHz

8720ET, 50 MHz to 20 GHz

8722ET, 50 MHz to 40 GHz

8719ES, 50 MHz to 13.5 GHz

8720ES, 50 MHz to 20 GHz

8722ES, 50 MHz to 40 GHz

The Agilent Technologies 8720E family of microwave network analyzers integrates a microwave source, tuned-receiver, and transmission/reflection or 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.

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Agilent Technologies

Transmission/reflection network analyzers

8719ET vector network analyzer,
50 MHz to 13.5 GHz

8720ET vector network analyzer,
50 MHz to 20 GHz

8722ET vector network analyzer,
50 MHz to 40 GHz

Included with a standard network analyzer is a manual set which includes an installation and quick start guide, user's guide, reference guide, programmer's guide, example programs CD-ROM, and a CD-ROM containing the manual set. A bandpass filter test device (P/N 0955-0446) and a 3-year return-to-Agilent service warranty are also included.

Transmission/reflection analyzer options

Any combination of the following options may be ordered with an ET model analyzer.

- 004** step attenuator: adds a 55-dB step attenuator to increase the source output power range.
- 010** time-domain capability: allows time-domain measurements.
- 1D5** high-stability frequency reference: replaces standard frequency reference with a higher stability unit.

S-parameter network analyzers

8719ES vector network analyzer,
50 MHz to 13.5 GHz

8720ES vector network analyzer,
50 MHz to 20 GHz

8722ES vector network analyzer,
50 MHz to 40 GHz

Included with a standard network analyzer is a manual set which includes an installation and quick start guide, user's guide, reference guide, programmer's guide, example programs CD-ROM, and a CD-ROM containing the manual set. A bandpass filter test device (P/N 0955-0446) and a 3-year return-to-Agilent service warranty are also included.

Network analyzer options

S-parameter analyzer options

Some ES options cannot be ordered with other options. See option compatibility table below.

- 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. Includes direct sampler access (Option 012).
- 089** frequency offset mode: modifies the test set and firmware. Provides mixer measurement capability, allowing a receiver frequency offset from the source.
- 1D5** high-stability frequency reference: replaces standard frequency reference with a higher stability unit.
- 400** adds fourth sampler and TRL calibration firmware: replaces the transfer switch with a solid-state switch/splitter.

The following options apply to both ET and ES models:

Hardware options

- 1CM** adds rack mount flange kit for use without handles
- 1CP** adds rack mount flange kit for use with handles¹

Information options

- 0B0** deletes manual set
- 0B1** adds extra manual set
- 0BW** adds service guide, part number 08720-90397

The following language options provide a translated user's guide:

- ABF** French manual, part number 5967-8509
- ABJ** Japanese manual, part number 5967-8503

Service options

- W01** converts three year return-to-Agilent service warranty to one year on-site service 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

- UK6** commercial calibration certification with test data

S-Parameter 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 ⁴	Yes	No ³
010 Time domain	Yes	Yes	—	Yes	Yes	Yes	Yes
012 Direct sampler access	Yes	Yes	Yes	—	No ⁵	Yes	Yes
085 High-power test	Yes	No ⁴	Yes	No ⁵	—	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 8720E family of network analyzers is supplied with handles.
2. Only where on-site service is 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. Option 085 includes direct sampler access (Option 012).

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, 7-16, 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 sales representative for the RF & Microwave Test Accessories Catalog (literature number 5968-4314E).

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. These systems require an Agilent 85097B interface kit 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

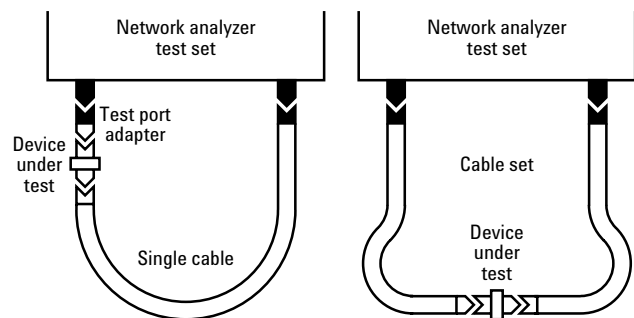
Agilent offers cables in the following types:

- 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

Option K11 PSC-3.5 slotless female center contact repair kit

85052C¹ 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 7 mm adapter
1250-1747 3.5 mm (m) to 7 mm 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

Option 001 deletes 3.5 mm to 7 mm adapters

Electronic calibration kits

85093C RF ECal:² 300 kHz to 9 GHz.

Option M0F

3.5 mm (m) to 3.5 mm (f) RF ECal module

Option 00M

3.5 mm (m) to 3.5 mm (m) RF ECal module

Option 00F

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:

300 kHz to 9 GHz 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

Verification kits

85053B 0.045 to 26.5 GHz

Cables for either 8719ET/ES or 8720ET/ES

85131C single, semi-rigid: 3.5 mm to 3.5 mm, 81 cm, 32 inches

85131D set, semi-rigid: 3.5 mm to 3.5 mm, 53 cm each, 21 inches

85131E single, flexible: 3.5 mm to 3.5 mm, 96 cm, 38 inches

85131F set, flexible: 3.5 mm to 3.5 mm, 53 cm each, 21 inches

Cables for the 8722ET/ES

85134C single, semi-rigid: 3.5 mm to 2.4 mm, 81 cm, 32 inches

85134D set, semi-rigid: 3.5 mm to 2.4 mm, 53 cm each, 21 inches

85134E single, flexible: 3.5 mm to 2.4 mm, 96 cm, 38 inches

85134F set, flexible: 3.5 mm to 2.4 mm, 53 cm each, 21 inches

Adapter sets

85130D 8719/8720 only: 3.5 mm³ to 3.5 mm

85130F 8722 only: 2.4 mm³ to 3.5 mm

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 interface kit.
3. Special rugged female connector specifically for connecting to the network analyzer test port, but does not mate with a standard male connector.

Measurement accessories, continued

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

85050C¹ 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

85091C RF ECal:² 300 kHz to 9 GHz.

7 mm to 7 mm RF ECal module

85060B MW ECal:² 1 GHz to 18 GHz. Includes:

85060-60002 7 mm to 7 mm MW ECal module

Option 001: adds a 300 kHz to 9 GHz

7 mm to 7 mm RF ECal module

Verification kit

85051B 8719/8720 only: 0.045 to 18 GHz

Cables for either 8719ET/ES or 8720ET/ES

85132C single, semi-rigid: 7 mm to 3.5 mm, 81 cm, 32 inches

85132D set, semi-rigid: 7 mm to 3.5 mm, 53 cm each, 21 inches

85132E single, flexible: 7 mm to 3.5 mm, 96 cm, 38 inches

85132F set, flexible: 7 mm to 3.5 mm, 53 cm each, 21 inches

Cables for the 8722ET/ES

85135C single, semi-rigid: 7 mm to 2.4 mm, 81 cm, 32 inches

85135D set, semi-rigid: 7 mm to 2.4 mm, 53 cm each, 21 inches

85135E single, flexible: 7 mm to 2.4 mm, 96 cm, 38 inches

85135F set, flexible: 7 mm to 2.4 mm, 53 cm each, 21 inches

Adapter sets

85130B 8719/20 only: 3.5 mm³ to 7 mm

85130E 8722 only: 2.4 mm³ to 7 mm

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

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

Electronic calibration kits

85092C RF ECal:² 300 kHz to 9 GHz.

Option M0F

Type-N (m) to Type-N (f) RF ECal module

Option 00M

Type-N (m) to Type-N (m) RF ECal module

Option 00F

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:² 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 300 kHz to 9 GHz

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

1. Kit includes open and short circuits, fixed loads, precision short airline, 7 mm connector tools, and gauges.

2. Requires an Agilent 85097A interface kit.

3. Special rugged female connector specifically for connecting to the network analyzer test port, but does not mate with a standard male connector.

Verification kit

85055A 8719/8720 only: 0.045 to 18 GHz

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 8719/8720 only: 3.5 mm¹ to Type-N

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 8722 only: 0.045 to 50 GHz

Cables for the 8722ET/ES

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

Adapter set

85130G 8722 only: 2.4 mm¹ to 2.4 mm

For devices with K connectors (2.92 mm)

Calibration kit

85056K² 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

Cables³

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

Adapters

11904A 2.4 mm (m) to K (m)
11904B 2.4 mm (f) to K (f)
11904C 2.4 mm (m) to K (f)
11904D 2.4 mm (f) to K (m)
11904S 2.4 mm to K adapter set

For devices with 7-16 connectors

Calibration kits

85038A standard: 30 kHz to 7.5 GHz. Includes:

85038-80002 7-16 (f) open
85038-80003 7-16 (m) open
85038-80004 7-16 (f) short
85038-80005 7-16 (m) short
85038-80006 7-16 (f) fixed load
85038-80007 7-16 (m) fixed load
8710-2175 torque wrench
8710-2174 open-end wrench

85038F economy: 30 kHz to 7.5 GHz. Includes:

85038-80002 7-16 (f) open
85038-80004 7-16 (f) short
85038-80006 7-16 (f) fixed load
11906-80016 7-16 (f) to 7-16 (f) adapter

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.

Measurement accessories, continued

85038M economy: 30 kHz to 7.5 GHz. Includes:

85038-80003 7-16 (m) open
85038-80005 7-16 (m) short
85038-80007 7-16 (m) fixed load
11906-80015 7-16 (m) to 7-16 (m) adapter

Electronic calibration kit

85098C RF ECal:¹ 300 kHz to 7.5 GHz.

Option M0F

7-16 (m) to 7-16 (f) RF ECal module

Option 00F

7-16 (f) to 7-16 (f) RF ECal module

Option 00M

7-16 (m) to 7-16 (m) RF ECal module

Option 00A adds:

11906-80015 7-16 (m) to 7-16 (m) adapter
11906-80016 7-16 (f) to 7-16 (f) adapter

Cables

Use the test port cables recommended for devices with 7 mm, 3.5 mm, or Type-N connectors and use the appropriate 11906 series adapter kit.

Adapter kits

11906A 7-16 to 7-16. Includes:

11906-80015 7-16 (m) to 7-16 (m) adapter
11906-80016 7-16 (f) to 7-16 (f) adapter
11906-80017 7-16 (m) to 7-16 (f) adapter (two included)

11906B 7-16 to Type-N. Includes:

11906-80007 Type-N (m) to 7-16 (m) adapter
11906-80008 Type-N (f) to 7-16 (f) adapter
11906-80009 Type-N (f) to 7-16 (m) adapter
11906-80010 Type-N (m) to 7-16 (f) adapter

11906C 7-16 to 7-mm. Includes:

11906-80012 7-mm to 7-16 (m) adapter (two included)
11906-80013 7-mm to 7-16 (f) adapter (two included)

11906D 7-16 to 3.5-mm. Includes:

11906-80002 3.5-mm (m) to 7-16 (m) adapter
11906-80005 3.5-mm (m) to 7-16 (f) adapter
11906-80004 3.5-mm (f) to 7-16 (m) adapter
11906-80003 3.5-mm (f) to 7-16 (f) adapter

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
8719/8720: 85132F cable set (set, flexible, 7 mm to 3.5 mm, 53 cm each, 21 inches)
8722: 85135F cable set (set, flexible, 7 mm to 2.4 mm, 53 cm each, 21 inches)
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
8719/8720: 85132F cable set (flexible, 7 mm to 3.5 mm, 53 cm each, 21 inches)
8722: 85135F cable set (flexible, 7 mm to 2.4 mm, 53 cm each, 21 inches)
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
8719/8720: 85131F cable set (set, flexible, 3.5 mm to 3.5 mm, 53 cm each, 21 inches)
8722: 85134F cable set (set, flexible, 3.5 mm to 2.4 mm, 53 cm each, 21 inches)
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 to 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
8722: 85133F cable set (set, flexible, 2.4 mm, 53 cm each, 21 inches)
R281A adapter (2.4 mm (f) to WR-28 waveguide adapter)
R281B adapter (2.4 mm (m) to WR-28 waveguide adapter)

1. Requires an Agilent 85097A ECal interface kit.

Test configuration accessories

Power meters¹

E4418B EPM series, single channel

E4419B EPM series, 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 amplifiers²

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 20 GHz 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, 23 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), 10 dB coupling

87301D coaxial: 1 to 40 GHz, 2.4 mm (f) or optional 2.92 mm (f), 13 dB coupling

87310B 90° coaxial: 1 to 18 GHz, SMA (f), 3 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, Agilent recommends ICM³ adjustable test fixture mainframe series TF-3000, which is compatible with the ICM TRL-3000 series calibration kits.

Bias supplies⁴

6626A precision DC power supply; 2 A, 50 V maximum

6629A quad-out precision GPIB DC power supply

4142B modular DC source/monitor; 10 A, 200 V maximum

Bias networks⁵

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

85070D high-temperature dielectric probe kit.

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 permittivity of materials. Standard software version runs on PC with Windows® 95, 98, 2000 ME or Windows NT® 4.0.

85071D materials measurement software.

Measures complex permeability and permittivity of materials in a transmission line environment. Software runs on a PC with Windows 95, 98, or Windows NT 4.0.

85190A IC-CAP modeling suite⁶

Design Software, Advanced Design System series (ADS) and Series IV⁶ connector repair kits

Application support

Agilent 50629E productivity assistance; provides one hour of on-site consulting and assistance delivered by an application engineer. Hourly charges apply from portal to portal to cover travel costs.

1. A power meter with the appropriate Agilent 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. For internally biasing with the 8719ES/8720ES/8722ES.
5. For supplying DC bias externally from test sets. Internal bias networks have a current limit of 0.5 A.
6. Consult with an Agilent systems application engineer. The product you order will depend on the test environment.

Peripheral accessories

Printers

For a current list of compatible printers, consult our printer-compatibility guide on the World Wide Web 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.)

Keyboard

A keyboard with mini-DIN cable can be connected to the Agilent 8720E family of network analyzers interface to form a remote front panel and to provide a quicker, more convenient way to enter titles, labels, and file names.

Equipment racks

5063-9223 rack mount flange kit, for use with handles; includes handles¹

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.

1181B system testmobile, 3 ft. tall (see literature number 5091-1233E)

1540-1695 operating case

9211-2657 transit case

Computers

Any computer configured with a GPIB interface card and software drivers

Monitors

Any VGA-compatible monitor

Literature and manuals

Literature

Agilent 8720E family overview, literature number 5968-5161E

Agilent 8720E family data sheet, literature number 5968-5163E

For more information about the Agilent 8720E family, visit our Web site at www.agilent.com/find/8720

Manuals

One manual set is included with each network analyzer. Additional manual sets and service manuals may be ordered as options when a network analyzer is purchased, or separately using the part numbers. For on-line manuals, visit our Web site at www.agilent.com/find/manuals

8719/20/22 ET/ES manual set, part number 08720-90390. Includes:

Installation and Quick Start Guide, 08720-90391

User's Guide, 08720-90392

Reference Guide, 08720-90393

Programmer's Guide, 08753-90475

CD-ROM, 08720-90418; includes all documents in the manual set

8719/20/22 ET/ES service guide, part number 08720-90397. Includes service guide on CD-ROM, part number 08720-90419.

1. The 8720E series of network analyzers is supplied with handles.

Upgrades

Network analyzer upgrade kits

Options may be added to an Agilent 8720E series network analyzer after initial purchase by ordering the instrument's model number followed by a "U" to indicate an upgrade, and specifying one or more of the following upgrade options. Some options are available only for certain models, as noted in the description. Refer to the option compatibility matrix on page 3 to determine if a desired option is compatible with existing options in an ES-model network analyzer.

- 004** adds 55-dB step attenuator to an ET model analyzer for extended output power range. Includes installation at an Agilent service center.
- 007** adds mechanical S-parameter transfer switch to an ES model analyzer, replacing the standard solid-state switch. Includes installation at an Agilent service center.
- 010** adds time domain capability. Includes installation at an Agilent service center.
- 012** modifies S-parameter test set in an ES model analyzer for direct sampler access. Front panel jumpers also allow standard instrument operation. Includes installation at an Agilent service center.
- 020** for 8719ET or 8719ES only. Adds 20 GHz operation. Includes installation at an Agilent service center.
- 040** for 8719ET/ES and 8720ET/ES only. Adds 40 GHz operation. Includes installation at the Agilent factory.
- 085** modifies S-parameter test set in an ES model analyzer for high power measurement capability and provides direct sampler access. Includes installation at the Agilent factory.
- 089** modifies S-parameter test set and firmware in an ES model analyzer for frequency offset mixer test capability. Includes installation at an Agilent service center.
- 1D5** adds high stability frequency reference. Includes installation at an Agilent service center.
- 400** adds fourth sampler and TRL calibration firmware to an ES model analyzer. Includes installation at the Agilent factory.

Agilent 8719D, 8720D, and 8722D analyzers can be upgraded to have their firmware include the new features introduced in the ES models with one of the following upgrades.

8719DU, 8720DU, or 8722DU upgrade kit

Option 000 performance upgrade kit for an 8719D, 8720D, or 8722D with firmware revision below 7.0. Adds new CPU board and firmware, which offers measurement and data-transfer speed improvements and the latest firmware. Includes installation at an Agilent service center.

Option 099 firmware upgrade for an 8719D, 8720D, or 8722D with firmware revision above 7.0.

This firmware upgrade can be installed by the user. The firmware is also available for download from Agilent's website. Go to www.agilent.com/find/8720

Application and product notes

	Pub. Number
<i>Understanding the Fundamental Principles of Vector Network Analysis</i> , Application note 1287-1	5965-7707E
<i>Exploring the Architectures of Network Analyzers</i> , Application note 1287-2	5965-7708E
<i>Applying Error Correction to Network Analyzer Measurements</i> , Application note 1287-3	5965-7709E
<i>Network Analyzer Measurements: Filter and Amplifier Examples</i> , Application note 1287-4	5965-7710E
<i>Improving Throughput in Network Analyzer Applications</i> , Application note 1287-5	5966-3317E
<i>Using a Network Analyzer to Characterize High-Power Components</i> , Application note 1287-6	5966-3319E
<i>Improving Network Analyzer Measurements of Frequency-Translating Devices</i> , Application note 1287-7	5966-3318E
<i>Simplified Filter Tuning Using Time-Domain Analysis</i> , Application note 1287-8	5968-5328E
<i>In-Fixture Measurements Using Vector Network Analyzers</i> , Application note 1287-9	5968-5329E
<i>10 Hints for Making Better Network Analyzer Measurements</i> , Application note 1291-1	5965-8166E
<i>Specifying Calibration Standards for the Agilent 8510 Network Analyzer</i> , Product note 8510-5A	5956-4352
<i>Applying TRL Cal to Non-Coaxial Measurements</i> , Product note 8510-8A	5091-3645E
<i>In-Fixture Microstrip Device Measurements Using TRL* Calibration</i> , Product note 8720-2	5091-1943E

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 engineering 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.

By internet, phone, or fax, get assistance with all your test and measurement needs

Online assistance:

www.agilent.com/find/assist

Phone or Fax

United States:

(tel) 1 800 452 4844

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