

Agilent E5071C Network Analyzer

- 9 kHz to 4.5/6.5/8.5 GHz
- 100 kHz to 4.5/6.5/8.5 GHz (with bias tees)
- 300 kHz to 14/20 GHz (with bias tees)

E5092A Configurable Multiport Test Set

Configuration Guide



This configuration guide describes standard configurations, options, accessories and peripherals for the E5071C ENA network analyzer. Refer to the ENA brochure for a complete description of the ENA network analyzer and the E5092A configurable multiport test set.



Agilent Technologies

E5071C ENA Network Analyzer

The ENA is an integrated network analyzer with a two- or four-port S-parameter test set, a synthesized RF source, a 10.4-inch color LCD, and a hard disk drive. A 1-year return-to-Agilent service warranty is included with the each ENA network analyzer.

Step 1: Select frequency range, number of test ports, and with or without bias tees

Up to 4.5 GHz range

9 kHz to 4.5 GHz (without bias tees)

E5071C-240 2-port S-parameter test set

E5071C-440 4-port S-parameter test set

100 kHz to 4.5 GHz (with bias tees)

E5071C-245 2-port S-parameter test set

E5071C-445 4-port S-parameter test set

Up to 6.5 GHz range

9 kHz to 6.5 GHz (without bias tees)

E5071C-260 2-port S-parameter test set

E5071C-460 4-port S-parameter test set

100 kHz to 6.5 GHz (with bias tees)

E5071C-265 2-port S-parameter test set

E5071C-465 4-port S-parameter test set

Up to 8.5 GHz range

9 kHz to 8.5 GHz (without bias tees)

E5071C-280 2-port S-parameter test set

E5071C-480 4-port S-parameter test set

100 kHz to 8.5 GHz (with bias tees)

E5071C-285 2-port S-parameter test set

E5071C-485 4-port S-parameter test set

Up to 14 GHz range

300 kHz to 14 GHz (with bias tees)

E5071C-2D5 2-port S-parameter test set

E5071C-4D5 4-port S-parameter test set

Up to 20 GHz range

300 kHz to 20 GHz (with bias tees)

E5071C-2K5 2-port S-parameter test set

E5071C-4K5 4-port S-parameter test set

Step 2: Select time base

E5071C-1E5 High stability time base

E5071C-UNQ Standard stability time base

Step 3: Select hard disk drive

E5071C-017 Removable hard disk drive

E5071C-019 Standard hard disk drive

Step 4: Choose additional options (Optional)

E5071C-008¹ Frequency offset mode

E5071C-TDR² Enhanced time domain analysis

E5071C-010 Time domain analysis

E5071C-790 Measurement Wizard Assistant software

Step 5: Choose accessories (Optional)

E5071C-1CM Rack mount kit,

E5071C-1CN Front handle kit

E5071C-1CP Rack mount and front handle kit

E5071C-810 Adds a keyboard

E5071C-820 Adds a mouse

Step 6: Choose certification documentation (Optional)

E5071C-1A7 ISO 17025 compliant calibration

E5071C-A6J ANSI Z540 compliant calibration

Step 7: Choose your warranty service (Optional)

3 year return-to Agilent warranty and service

5 year return-to Agilent warranty and service

Documentation

The documentation for the E5071C is located in the Online Help system for the E5071C ENA network analyzer. The ENA Service Guide and Online Help system are also available on the Web site:

www.agilent.com/find/ena

Additional product information

For additional product information, refer to the ENA brochure available on the Web site:

www.agilent.com/find/ena

1. Order the 82357B USB/GPIB interface at the same time if you want to control power meters with the E5071C. This will allow you to conduct scalar mixer calibrations (SMC), power calibrations, or receiver calibrations after power calibrations.
2. E5071C-TDR is a superset of E5071C-010. E5071C-TDR and E5071C-010 are mutually exclusive options and there is no need to purchase both options.

E5071CEP ENA Network Analyzer – Express Configuration

The Agilent E5071CEP ENA series network analyzer express configurations are preconfigured option packages for off-the-shelf delivery from our authorized distributors. The express configurations deliver the same specifications and functionality as Agilent’s build-to-order instruments and also provide the same level of upgradeability, ensuring that they can evolve as your test needs change. For more detail, visit, www.agilent.com/find/express-e5071c

Model

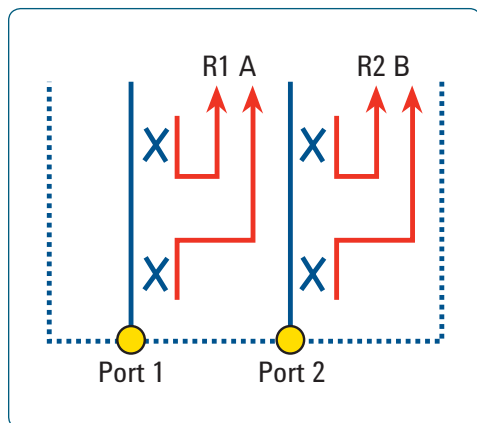
Options	Description
E5071CEP	ENA Series Network Analyzer – Express Configuration

Options

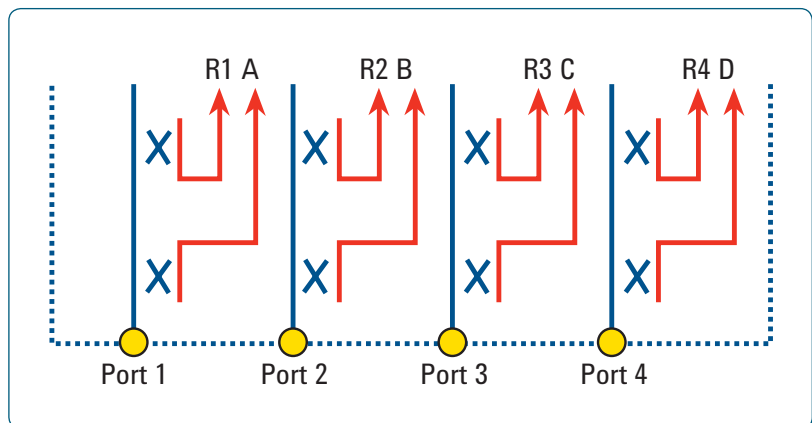
Options	Frequency	Connector Type	Number of Port	Bias Tee	Equivalent standard model option ¹
E5071CEP-240	9 kHz to 4.5 GHz	Type-N (f)	2	No	E5071C-240/UNQ/019
E5071CEP-280	9 kHz to 8.5 GHz	Type-N (f)	2	No	E5071C-280/UNQ/019
E5071CEP-2K5	300 kHz to 20 GHz	3.5mm (m)	2	Yes	E5071C-2K5/UNQ/019

- Equivalent standard model options
 Option UNQ : Standard stability time base
 Option 019 : Standard hard disk drive

Receiver assignment



2-port test set option



4-port test set option

E5071C ENA Network Analyzer

Options

To add options to a product, order the corresponding item number.

Option ¹	Description	Additional information
Test set Option 240 Option 440 Option 245 Option 445 Option 260 Option 460 Option 265 Option 465 Option 280 Option 480 Option 285 Option 485	2-port test set, 9 kHz to 4.5 GHz without bias tees 4-port test set, 9 kHz to 4.5 GHz without bias tees 2-port test set, 100 kHz to 4.5 GHz with bias tees 4-port test set, 100 kHz to 4.5 GHz with bias tees 2-port test set, 9 kHz to 6.5 GHz without bias tees 4-port test set, 9 kHz to 6.5 GHz without bias tees 2-port test set, 100 kHz to 6.5 GHz with bias tees 4-port test set, 100 kHz to 6.5 GHz with bias tees 2-port test set, 9 kHz to 8.5 GHz without bias tees 4-port test set, 9 kHz to 8.5 GHz without bias tees 2-port test set, 100 kHz to 8.5 GHz with bias tees 4-port test set, 100 kHz to 8.5 GHz with bias tees	Test port connector: Type-N (f)
Option 2D5 Option 4D5 Option 2K5 Option 4K5	2-port test set, 300 kHz to 14 GHz with bias tees 4-port test set, 300 kHz to 14 GHz with bias tees 2-port test set, 300 kHz to 20 GHz with bias tees 4-port test set, 300 kHz to 20 GHz with bias tees	Test port connector: 3.5 mm (m)
Time base Option UNQ Option 1E5	Standard stability time base High stability time base	Adds a higher stability time base reference.
Hard disk drive Option 017 Option 019	Removable hard disk drive Standard hard disk drive	
Additional features Option 008 ² Option TDR ³ Option 010 Option 790 ⁴	Frequency offset mode Enhanced time domain analysis Time domain analysis Measurement wizard assistant software	Adds frequency-offset sweep and harmonic measurement capabilities. Adds time domain transform, gating capabilities and graphical user interface to simplify time domain measurements. Adds time domain transform and gating capabilities. Adds Measurement Wizard Assistant (MWA) software to simplify your multipoint measurements with the 4-port ENA
Accessories Option 1CM Option 1CN Option 1CP Option 810 Option 820	Rack mount kit Front handle kit Rack mount and front handle kit Add keyboard Add mouse	
Calibration documentation Option 1A7 Option A6J	ISO 17025 compliant calibration ANSI Z540 compliant calibration	

1. Options are ordered using the combined model/option number, e.g. E5071C-240.

2. Order the 82357B USB/GPIB interface at the same time if you want to control power meters with the E5071C. This will allow you to conduct scalar mixer calibrations (SMC), power calibrations, or receiver calibrations after power calibrations.

3. Option TDR is a superset of Option 010. Option TDR and Option 010 are mutually exclusive options and there is no need to purchase both options.

4. When using an ECal module with the MWA calibration wizard, a 4-port ECal module (i.e. N4431B, N4433A) is required.

E5092A Configurable Multiport Test Set

This guide is intended to assist you in the ordering process of the E5092A configurable multiport test set for use with the 4-port ENA (E5070B, E5071B and E5071C). Multiple multiport measurement configurations, from 50 MHz to 20 GHz, can be made by connecting included semi-rigid cables to the E5092A's front panel which accesses its internal switches.

Step 1:¹ Select appropriate cable and adapter set for connection to the ENA (Optional)

- E5092A-08C** Cables and adapters for connection to E5071C Option 440/445/460/465/480/485
- E5092A-20C** Cables and adapters for connection to E5071C Option 4D5/4K5

Step 2: Choose accessories (Optional)

- E5092A-1CM** Rack mount kit only
- E5092A-1CN** Front handle kit only
- E5092A-1CP** Rack mount kit with handle kit

Step 3: Choose calibration certification documentation (Optional)

- E5092A-1A7** ISO 17025 compliant calibration
- E5092A-A6J** ANSI Z540 compliant calibration

Step 4: Choose your warranty service (Optional)

- 3 year return-to-Agilent warranty and service
- 5 year return-to-Agilent warranty and service

Documentation

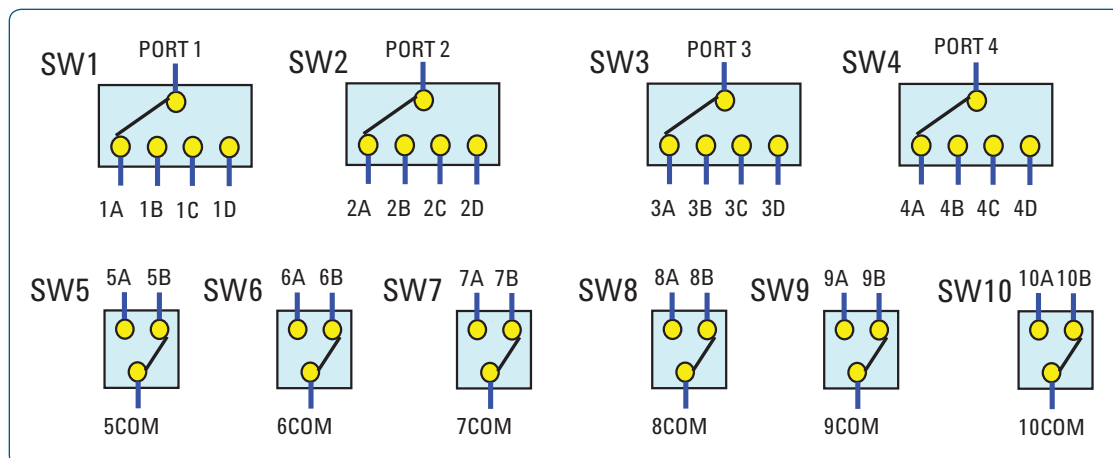
The documentation for the E5092A is located in the Online Help system for the E5071C ENA network analyzer. The ENA Service Guide and Online Help system are also available on the Web site: www.agilent.com/find/ena

Additional product information

For additional product information, refer to the ENA brochure available on the Web site: www.agilent.com/find/ena
www.agilent.com/find/multiport

Block diagram

E5092A (Option 020)



1. Semi-rigid cables are designed for connection to the E5071C and are not available for the E5070B, E5071B.

E5092A Configurable Multiport Test Set

Options

To add options to a product, order the corresponding option number.

Option ¹	Description	Additional information
Test set Option 020	20 GHz switching test set	Up to 22-port or 10-port full crossbar measurement.
Cable adapter set Option 08C	Cable and adapter set for E5071C Option 440/445/460/465/480/485 (4.5 GHz/6.5 GHz/8.5 GHz)	Adds SMA semi-rigid cables and type-N-to-SMA adapters for connection to the E5071C.
Option 20C	Cable and adapter set for the E5071C Option 4D5/4K5 (14 GHz/20 GHz)	Adds SMA semi-rigid cables and 3.5 mm-to-3.5 mm adapters for connection to the E5071C.
Accessories Option 1CM	Rack mount kit	Adds a rack mount kit (part number: 5063-9214) for use without handles.
Option 1CN	Front handle kit	Adds a front handle kit (part number: 5063-9227).
Option 1CP	Rack mount and front handle kit	Adds a rack mount and front handle kit (part number: 5063-9221).
Calibration documentation Option 1A7 Option A6J	ISO 17025 compliant calibration ANSI Z540 compliant calibration	

1. Options are ordered using the combined model/option number, e.g. E5092A-020.

ENA Network Analyzer (E5071C)

Additional software options

Option TDR Enhanced time domain analysis

Option TDR enables the ENA to view reflection and transmission responses in the time domain using a simple and intuitive graphical user interface. Use time domain to tune filters, gate out the response of fixtures and cables, characterize the impedance of transmission lines, and more.

Option 010 Time domain analysis

Option 010 enables the ENA to view reflection and transmission responses in the time domain. Use time domain to tune filters, gate out the response of fixtures and cables, characterize the impedance of transmission lines, and more.

Option 008 Frequency offset mode

Option 008 enables the ENA to set the receiver frequencies independently from where the source frequency is tuned. This ability is important for harmonic distortion measurements and for measuring frequency converting devices such as mixers and converters. Advanced calibration techniques for the ENA, such as scalar mixer calibration (SMC) or vector mixer calibration (VMC), require this option.

Option 790 Measurement Wizard Assistant

Option 790 provides a simple measurement procedure setup for the 4-port ENA with a multiport test set such as the E5092A. The software delivers an easy-to-use measurement wizard programs including a calibration wizard setup¹, which reduces operation time for complicated, time-consuming multiport measurements.

Time base options

Option UNQ Standard stability time base

Option UNQ provides following stability:
CW accuracy: ± 5 ppm (specification)
Source stability: ± 5 ppm (5 °C to 40 °C typical)

Option 1E5 High stability time base

Option 1E5 provides the following stability:
CW accuracy: ± 1 ppm (specification)
Source stability: ± 0.05 ppm (5 °C to 40 °C typical),
 ± 0.5 ppm/year

Hard disk drive options

Option 019 Standard hard disk drive

Option 019 provides a fixed hard disk drive. The removable disk drive is not available.

Option 017 Removable hard disk drive

Option 017 provides a removable hard disk drive. You can remove or replace the hard disk drive for secure area operations. If a spare disk is needed, order E5071CU-018 or E5071CU-028 hard disk drive kit.



Certification options

Option 1A7 ISO 17025 compliant calibration

Option 1A7 provides a complete set of measurements which test the unit to manufacturer's published specifications. Includes calibration label, ISO 17025 calibration certificate, and data report, and measurement uncertainties and guardbands on all customer specifications. Conforms to ISO 17025 and ISO 9001.

Option A6J ANSI Z540 compliant calibration

Option A6J provides a complete set of measurements which test the unit to manufacturer's published specifications. Includes pre- and post-adjustment data and measurement uncertainty information compliant with the ANSI/NCSL Z540 standard.

1. When using an ECal module with MWA calibration wizard, a 4-port ECal module (i.e. N4431B, N4433A) is required.

Measurement Accessories

A complete list of RF and microwave test accessories is available on our Web site:

www.agilent.com/find/accessories

Accessories are available with the following connector types: 50 Ω Type-N, 3.5 mm, 7 mm, 2.4 mm, 2.92 mm, 1.85 mm, 1.0 mm and waveguide.

Test port cables and a calibration kit/ECal module should be added for a complete measurement system.

Calibration kits

Coaxial measurements

Mechanical calibration kits include standards, such as opens, shorts and loads, which are measured by the network analyzer for increased measurement accuracy.

Electronic calibration (ECal) kits replace mechanical calibration standards with one solid-state calibration module that is controlled by the network analyzer via USB. ECal kits provide many different impedances to the test ports which enables a full two-port calibration to be performed quickly with a single connection. This technique reduces operator errors and connector wear and abrasion.

Choose a calibration kit for each connector type to be used.

Economy, includes:

- open standards (male and female)
- short standards (male and female)
- fixed-termination standards (male and female)

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

- sliding load standards¹ (male and female) or a series of offset shorts

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

- 50 Ω airline(s) for TRL calibration
- TRL adapters

Waveguide measurements

For waveguide measurements, Agilent offers mechanical calibration kits that include:

- waveguide-to-coax adapters (X, P, K, R, Q, U, and V bands)
- precision waveguide section
- flush short circuit
- fixed terminations²
- straight section

Cables and adapter sets

Agilent offers the following types of cables:

- single cables: semi-rigid or flexible
- cable sets: semi-rigid or flexible

There are also adapter sets 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.

1. A sliding load is not supported by the ENA.

2. An offset load is not supported by the ENA.

For devices with 50 Ω Type-N connectors

Mechanical calibration kits

- **85032F** economy: DC to 9 GHz. Includes:
 - 85032-60017 Type-N (m) fixed load
 - 85032-60018 Type-N (f) fixed load
 - 85032-60013 Type-N (m) open
 - 85032-60014 Type-N (f) open
 - 85032-60016 Type-N (m) short
 - 85032-60015 Type-N (f) short
 - **Option 85032F-100** adds:
 - 85032-60021 Type-N (f) to Type-N (f) adapter
 - **Option 85032F-200** adds:
 - 85032-60019 Type-N (m) to Type-N (m) adapter
 - **Option 85032F-300** adds:
 - 85032-60020 Type-N (m) to Type-N (f) adapter
 - **Option 85032F-500** adds:
 - 85054-60001 Type-N (f) to 7 mm adapter (two included)
 - 85054-60009 Type-N (m) to 7 mm adapter (two included)
- **85054D** economy: DC 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: 300 kHz to 9 GHz, 2 ports**
 - Includes:
 - Option 85092C-MOF** module with:
 - 85092-60008 Type-N (f) to Type-N (m) RF ECal module
 - Option Option 85092C-00M** module with:
 - 85092-60009 Type-N (m) to Type-N (m) RF ECal module
 - Option 85092C-00F** module with:
 - 85092-60010 Type-N (f) to Type-N (f) RF ECal module
 - Option 85092C-00A** adds:
 - 85054-60037 Type-N (f) to Type-N (f) adapter
 - 85054-60038 Type-N (m) to Type-N (m) adapter
- **N4431B Microwave ECal: 9 kHz to 13.5 GHz, 4 ports¹**
 - Includes:
 - Option 020** module with:
 - N4431-60007 4 x Type-N (f) ECal module

N4431B-xxx mixed-connector options:

Connector type	Port A option	Port B option	Port C option	Port D Option
3.5 mm (f)	101	201	301	401
3.5 mm (m)	102	202	302	402
Type-N 50 Ω (f)	103	203	303	403
Type-N 50 Ω (m)	104	204	304	404
7-16 (f)	105	205	305	405
7-16 (m)	106	206	306	406

1. Performance from 9 kHz to 300 kHz is valid only for the E5071C ENA network analyzer with firmware version A.09.10 or higher.

□ **N4432A Microwave ECal: 300 kHz to 18 GHz, 4 ports**

Includes:

Option 020 module with:

N4432-60003 4 x Type-N (f) ECal module

N4432A-xxx mixed-connector options:

Connector type	Port A option	Port B option	Port C option	Port D Option
3.5 mm (f)	101	201	301	401
3.5 mm (m)	102	202	302	402
Type-N 50 Ω (f)	103	203	303	403
Type-N 50 Ω (m)	104	204	304	404

□ **N4690B Microwave ECal: 300 kHz to 18 GHz, 2 ports**

Includes:

Option M0F module with:

N4690-60001 Type-N (f) to Type-N (m) ECal module

Option 00M module with:

N4690-60002 Type-N (m) to Type-N (m) ECal module

Option 00F module with:

N4690-60003 Type-N (f) to Type-N (f) 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

Cables

□ **N6314A** 50 Ω Type-N RF cable, DC to 12.4 GHz includes 8120-8862 one 610 mm (24 in) cable with male connectors

□ **N6315A** 50 Ω Type-N RF cable, DC to 12.4 GHz includes 8121-0027 one 610 mm (24 in) cable with both female and male connectors

Adapters

□ **11853A** 50 Ω Type-N accessory kit. Includes:
 1250-1472 Type-N (f) to Type-N (f) adapter (two included)
 1250-1475 Type-N (m) to Type-N (m) adapter (two included)
 11511A Type-N (f) short
 11512A Type-N (m) short

□ **11878A** Type-N to 3.5 mm adapter kit. Includes:
 1250-1744 3.5 mm (f) to 50 Ω Type-N (m) adapter
 1250-1743 3.5 mm (m) to 50 Ω Type-N (m) adapter
 1250-1745 3.5 mm (f) to 50 Ω Type-N (f) adapter
 1250-1750 3.5 mm (m) to 50 Ω Type-N (f) adapter

□ **11524A** 7 mm to Type-N (f) adapter

□ **11525A** 7 mm to Type-N (m) adapter

□ **85130C^{1,2}** 3.5 mm to Type-N Includes:
 85054-60029 NMD-3.5 mm to Type-N (f)
 85054-60030 NMD-3.5 mm to Type-N (m)

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

2. Recommended to connect H device to E5071C option xD5/xK5 which has NMD-3.5 mm (m) connectors.

For devices with 3.5 mm or SMA connectors

Mechanical calibration kits

- **85033E** economy: DC to 9 GHz. Includes:
 - 85033-60016 3.5 mm (m) load
 - 85033-60017 3.5 mm (f) load
 - 85033-60018 3.5 mm (m) open
 - 85033-60019 3.5 mm (f) open
 - 85033-60020 3.5 mm (m) short
 - 85033-60021 3.5 mm (f) short
 - 8710-1761 torque wrench
 - Option 85033E-100** adds:
 - 85027-60005 3.5 mm (f) to 3.5 mm (f) adapter
 - Option 85033E-200** adds:
 - 85027-60007 3.5 mm (m) to 3.5 mm (m) adapter
 - Option 85033E-300** adds:
 - 85027-60006 3.5 mm (m) to 3.5 mm (f) adapter
 - Option 85033E-400** adds:
 - 1250-1744 3.5 mm (f) to 50 Ω Type-N (m) adapter
 - 1250-1743 3.5 mm (m) to 50 Ω Type-N (m) adapter
 - 1250-1745 3.5 mm (f) to 50 Ω Type-N (f) adapter
 - 1250-1750 3.5 mm (m) to 50 Ω Type-N (f) adapter
 - Option 85033E-500** adds:
 - 1250-1746 3.5 mm (m) to 7 mm adapter (two included)
 - 1250-1747 3.5 mm (f) to 7 mm adapter (two included)
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- **85052C** precision TRL: DC 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: DC 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

Electronic calibration kits

- **85093C** RF ECal: 300 kHz to 9 GHz, 2 ports
 - Standard module includes:
 - Option M0F** with:
 - 85093-60008 3.5 mm (f) to 3.5 mm (m) ECal module
 - Option 00F** module with:
 - 85093-60010 3.5 mm (f) to 3.5 mm (f) ECal module
 - Option 00M** module with:
 - 85093-60009 3.5 mm (m) to 3.5 mm (m) 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

85093C-xxx mixed-connector options:

Port A option			Port B option					
Type	(f)	(m)	Type	(f)	(m)	Type	(f)	(m)
3.5 mm	101	102	Type-N	203	204	7-16	205	206

- **N4431B Microwave ECal: 9 kHz to 13.5 GHz, 4 ports¹**
 - Includes:
 - Option 010** module with:
 - N4431-60006 4 x 3.5 mm (f) ECal module

N4431B-xxx mixed-connector options:

Connector type	Port A option	Port B option	Port C option	Port D option
3.5 mm		201	301	401
3.5 mm (m)	102	202	302	402
Type-N 50 Ω (f)	103	203	303	403
Type-N 50 Ω (m)	104	204	304	404
7-16 (f)	105	205	305	405
7-16 (m)	106	206	306	406

- **N4433A Microwave ECal: 300 kHz to 20 GHz, 4 ports**
 - Includes:
 - Option 010** module with:
 - N4433-60003 4 x 3.5 mm (f) ECal module

1. Performance from 9 kHz to 300 kHz is valid only for the E5071C ENA network analyzer with firmware version A.09.10 or higher.

N4433A-xxx mixed-connector options:

Connector type	Port A option	Port B option	Port C option	Port D option
3.5 mm (f)	101	201	301	401
3.5 mm (m)	102	202	302	402

□ N4691B Microwave ECal: 300 kHz to 26.5 GHz, 2 ports.

Includes:

Option MOF module with:

N4691-60001 3.5 mm (f) to 3.5 mm (m) ECal module

Option OOM module with:

N4691-60002 3.5 mm (m) to 3.5 mm (m) ECal module

Option OOF module with:

N4691-60003 3.5 mm (f) to 3.5 mm (f) ECal module

Option OOA 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

Cables

- **11500E^{2, 3}** cable, APC 3.5 mm (m), DC to 26.5 GHz
Includes: one 610 mm (24 in) with male connectors.
- **11500F^{2, 3}** 150 cm cable, APC 3.5 mm (m), DC to 26.5 GHz
Includes: one 1520 mm (60 in) with male connectors.
- **85131C¹** single, semi-rigid: 3.5 mm (f) to PSC-3.5 mm (f), 81 cm, 32 inches
- **85131D¹** set, semi-rigid:
85131-60009 one 3.5 mm (f) to 3.5 mm (m), 53 cm, 21 inches,
85131-60010 one 3.5 mm (f) to PSC-3.5 mm (f), 53 cm, 21 inches
- **85131E¹** single, flexible: 3.5 mm (f) to PSC-3.5 mm (f), 96.5 cm, 38 inches
- **85131F¹** set, flexible:
85131-60012 one 3.5 mm (f) to 3.5 mm (m), 62.2 cm, 24.5 inches
85131-60013 one 3.5 mm (f) to PSC-3.5 mm (f), 62.2 cm, 24.5 inches
- **85131G¹** single, semi-rigid: 3.5 mm (f) to 3.5 mm (m), 53 cm, 21 inches
- **85131H¹** single, flexible: 3.5 mm (f) to 3.5 mm (m), 62.2 cm, 24.5 inches
- **85134C¹** single, semi-rigid: PSC-3.5 mm (f) to 2.4 mm (f), 81 cm, 32 inches

- **85134D¹** set, semi-rigid:
85134-60002 one 2.4 mm (f) to PSC-3.5 mm (f), 53 cm, 21 inches
85134-60001 one 2.4 mm (f) to PSC-3.5 mm (m), 53 cm, 21 inches
- **85134E¹** single, flexible: PSC-3.5 mm (f) to 2.4 mm (f), 96 cm, 38 inches
- **85134F¹** set, flexible:
85134-60004 one 2.4 mm (f) to PSC-3.5 mm (f), 61 cm, 24 inches
85134-60003 one 2.4 mm (f) to PSC-3.5 mm (m), 61 cm, 24 inches
- **85134G¹** single, semi-rigid: 2.4 mm (f) to PSC-3.5 mm (m), 53 cm, 21 inches
- **85134H¹** single, flexible: 2.4 mm (f) to PSC-3.5 mm (m), 61 cm, 24 inches
- **N4419AK20** single, flexible: 3.5 mm (m) to 3.5 mm (f), 91.4 cm, 36 inches
- **Z5623A-B20** set of 4, flexible: 3.5 mm (m) to 3.5 mm (m), 91.4 cm, 36 inches (phase-matched)

Adapters

- **11853A** 50 Ω Type-N accessory kit.
Includes:
1250-1472 Type-N (f) to Type-N (f) adapter (two included)
1250-1475 Type-N (m) to Type-N (m) adapter (two included)
85032-60009 Type-N (f) short
85032-60008 Type-N (m) short
- **11878A** Type-N to 3.5 mm adapter kit.
Includes:
1250-1744 3.5 mm (f) to 50 Ω Type-N (m) adapter
1250-1743 3.5 mm (m) to 50 Ω Type-N (m) adapter
1250-1745 3.5 mm (f) to 50 Ω Type-N (f) adapter
1250-1750 3.5 mm (m) to 50 Ω Type-N (f) adapter
- **11524A** 7 mm to Type-N (f) adapter
- **11525A** 7 mm to Type-N (m) adapter
- **85130C¹** 3.5 mm to Type-N
Includes:
85054-60029 NMD-3.5 mm to Type-N (f)
85054-60030 NMD-3.5 mm to Type-N (m)
- **85130D¹** 3.5 mm to 3.5 mm
Includes:
85130-60005 NMD-3.5 mm to PSC-3.5 mm (f)
85130-60006 NMD-3.5 mm to PSC-3.5 mm (m)
- **85130F¹** 2.4 mm to 3.5 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. 1250-1744 3.5 mm (f) to 50 Ω Type-N (m) adapters are recommended to connect to the E5071C Option x4x, x6x, and x8x test ports, which have Type-N (f) connectors.
3. NMD-3.5 mm (f) to 3.5 mm (f), or 3.5 mm (f) to 3.5 mm (f) adapters are recommended to connect to the E5071C Option xD5, xK5, which have NMD-3.5 mm (m) connectors.

For devices with 75 Ω Type-N connectors

Mechanical calibration kits

- **85036B** DC to 3 GHz, includes:
 - 00909-60019 75 Ω Type-N (m) broadband load
 - 00909-60020 75 Ω Type-N (f) broadband load
 - 85036-60012 75 Ω Type-N (m) short
 - 85036-60011 75 Ω Type-N (f) short
 - 85032-60007 75 Ω Type-N (m) open
 - 85032-20001 75 Ω Type-N (f) open body
 - 85036-60010 75 Ω Type-N (f) open center conductor extender
 - 85036-60013 75 Ω Type-N (m) to (m) adapter
 - 85036-60014 75 Ω Type-N (f) to (f) adapter
 - 85036-60015 75 Ω Type-N (m) to (f) adapter
- **85036E** DC to 3 GHz, includes:
 - 00909-60019 75 Ω Type-N (m) broadband load
 - 85036-60016 75 Ω Type N (m) combined open/short

Adapters

- **11852B** Minimum-loss pad
Option 11852B-004 Type-N connectors, 50 Ω (m) to 75 Ω (f)

Calibration must be done with a 75 Ω calibration kit using an 11852B minimum-loss pad, and impedance conversion to 75 Ω using the ENA's fixture simulator function is required.

For devices with waveguide

Mechanical calibration kits

X Band

- **X11644A** 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
- **85132F** cable set (set of 2, flexible 7 mm to 3.5 mm, 62.9 cm each, 24.75 inches each)
- **85135F** cable set (set of 2, flexible, 7 mm to 2.4 mm, 53 cm each, 21 inches each)
- **X281C** adapter (included in calibration kit):
WR-90 to 7 mm

P Band

- **P11644A** 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
- **85132F** cable set (set of 2, flexible, 7 mm to 3.5 mm, 62.9 cm each, 24.75 inches each)
- **85135F** cable set (set of 2, flexible, 7 mm to 2.4 mm, 53 cm each, 21 inches each)
- **P281C** adapter (included in calibration kit):
WR-62 to 7 mm

K Band

- **K11644A** 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
- **85134F** cable set (set of 2, flexible, 3.5 mm to 2.4 mm, 53 cm each, 21 inches each)
- **K281C** adapter (included in calibration kit):
WR-42 to 3.5 mm (f)
Option 012¹ WR-42 to 3.5 mm (m)

1. For this option order K281C-012.

Additional Accessories

Power limiters

- **N9355B** power limiter, 10 dBm limiting threshold, 10 MHz to 18 GHz, Type-N
- **N9356B** power limiter, 25 dBm limiting threshold, 10 MHz to 18 GHz, Type-N
- **N9355C** power limiter, 10 dBm limiting threshold, 10 MHz to 26.5 GHz, 3.5 mm
- **N9356C** power limiter, 25 dBm limiting threshold, 10 MHz to 26.5 GHz, 3.5 mm

DC blocks

- **N9398C** DC block, 16 V maximum working voltage, 50 kHz to 26.5 GHz, 3.5 mm
- **N9399C** DC block, 50 V maximum working voltage, 700 kHz to 26.5 GHz, 3.5 mm
- **11742A**, 50 V maximum working voltage, 45 MHz to 26.5 GHz, 3.5 mm

Amplifiers

- **87405B** pre-amplifier, 22 dB gain, 10 MHz to 4 GHz
- **87405C** pre-amplifier, 25 dB gain, 100 MHz to 18 GHz
- **87415A** amplifier, 25 dB gain, 2 to 8 GHz
- **83006A** amplifier, 20 dB gain, 10 MHz to 26.5 GHz

Attenuators

- **8491A** fixed attenuator, DC to 12.4 GHz, Type-N
- **8493A** fixed attenuator, DC to 12.4 GHz, SMA

RF & microwave switches

- **N1810TL** SPDT switch, terminated, DC to 26.5 GHz
- **N1810UL** SPDT switch, unterminated, DC to 26.5 GHz
- **87104B** SP4T switch, terminated, DC to 20 GHz
- **87106B** SP6T switch, terminated, DC to 20 GHz
- **87222C** transfer switch, DC to 26.5 GHz
- **L7104B** SP4T switch, terminated, DC to 20 GHz
- **L7106B** SP6T Switch, terminated, DC to 20 GHz
- **L7222C** transfer switch, DC to 26.5 GHz
- **P9400C** solid state PIN diode transfer switch, 100 MHz to 18 GHz
- **P9402C** SPDT solid state PIN diode switch, 100 MHz to 18 GHz
- **P9404C** SP4T solid state PIN diode switch, 100 MHz to 18 GHz
- **U9397C** SPDT solid state FET hybrid switch, 300 kHz to 18 GHz
- **U9400C** solid state FET hybrid transfer switch, 300 KHz to 18 GHz

Power meters and sensors¹

Recommended for source output power calibration.

- **E4416A¹** single-channel EPM-P series power meter
- **E4417A¹** dual-channel EPM-P series power meter
- **E4418B¹** single-channel EPM series power meter
- **E4419B¹** dual-channel EPM series power meter
- **N1911A¹** single-channel P-series power meter
- **N1912A¹** dual-channel P-series power meter
- **8482A** power sensor, 100 kHz to 4.2 GHz, Type-N (m), 100 mW
- **E9304A-H18** power sensor, 9 kHz to 18 GHz, Type-N (m), 100 mW
- **E4412A** CW power sensor, 10 MHz to 18 GHz, Type-N (m), 200 mW
- **E4413A** CW power sensor, 50 MHz to 26.5 GHz, 3.5 mm (m), 200 mW
- **N1921A** power sensor 50 MHz to 18 GHz, Type-N (m)
- **N1922A** power sensor 50 MHz to 40 GHz, 2.4 mm (m)
- **U2000A/B/H²** USB power sensor, 10 MHz to 18 GHz, Type-N (m)
- **U2001A/B/H²** USB power sensor, 10 MHz to 6 GHz, Type-N (m)
- **U2002A/H²** USB power sensor, 50 MHz to 24 GHz, 3.5 mm (m)
- **U2004A²** USB power sensor, 9 kHz to 6 GHz, Type-N (m)

Probes

- **N1021B** 18 GHz differential TDR/TDT passive probe kit
- **N1020A** 6 GHz single-ended TDR/TDT passive probe
- **85024A** high-frequency probe, 300 kHz to 3 GHz

General accessories

System racks and cases

- **1CN005A** handle kit, may be ordered as option 1CN (two included)
- **1CM015A** rack mount kit, for use without handles: may be ordered as option 1CM
- **1CP009A** rack mount kit, for use with previously supplied handles; may be ordered as option 1CP
- **E3663AC** rack mount rail kit, for use with 5063-9216 or 5188-4430
- **1181BZ** test mobile system cart

Interface cables

The following GPIB cables can be used to connect the network analyzer with an external device such as a computer

- **10833A** GPIB cable, 1.0 m (3.3 ft)
- **10833B** GPIB cable, 2.0 m (6.6 ft)
- **10833C** GPIB cable, 4.0 m (13.1 ft)
- **10833D** GPIB cable, 0.5 m (1.6 ft)
- **82357B** GPIB to USB interface, necessary to control a power meter or signal generator with the E5071C.

Monitors

- XGA-compatible monitor

Printers

- USB printers with Microsoft® Windows printer driver

1. Order the 82357B USB/GPIB interface to control a power meter by the E5071C.
2. To use the U200x USB power sensors for source power calibration, the E5071C ENA firmware version A.09.2x or higher is required.

Upgrade kits

Upgrade kits for the E5071C

Protecting your hardware investment

The E5071C ENA network analyzer is a safe investment because of its flexibility. Easily upgrade any ENA software or hardware feature whenever you need that feature.

Ordering instructions

To upgrade an existing E5071C, order the corresponding model number as the followings. For further information, such as time required by the service center, visit:

http://www.agilent.com/find/ena_upgrades

Software option upgrades

- a) Add Frequency-offset mode option (Customer installable):
Order the E5003A with E5003A-1FP
Frequency-offset mode for the E5071C.
- b) Add Enhanced time domain analysis option (Return to Service Center for Installation)
 - b-1) Order E5008A with E5008A-1FP Enhanced time domain analysis for the E5071C, if Option 010 is not already installed.
 - b-2) Order E5009A with E5009A-1FP Enhanced time domain analysis from Option 010 for the E5071C, if Option 010 is already installed.
- c) Add Time domain analysis option (Customer installable):
Order the E5004A with E5004A-1FP Time domain analysis for the E5071C.
- d) Add Measurement Wizard Assistant software (Customer installable):
Order the E5005A with E5005A-1FP Measurement wizard assistant software for the E5071C.

Hardware option upgrades

(Installed by the Agilent service center)

Please refer to "E5071C Test set option table" below and the "E5071C Hardware upgrade option matrix" on page 14 of this document for help selecting the proper upgrade options.

E5071C Upgrade option list

a) Maximum frequency upgrade

E5071CU-260	from 4.5GHz to 6.5GHz for E5071C-240
E5071CU-265	from 4.5GHz to 6.5GHz for E5071C-245
E5071CU-280	from 4.5GHz to 8.5GHz for E5071C-240
E5071CU-281	from 6.5GHz to 8.5GHz for E5071C-260
E5071CU-285	from 4.5GHz to 8.5GHz for E5071C-245

E5071CU-286	from 6.5GHz to 8.5GHz for E5071C-265
E5071CU-2D5	from 8.5GHz to 14GHz for E5071C-280/285
E5071CU-2K5	from 8.5GHz to 20GHz for E5071C-280/285
E5071CU-2K6	from 14GHz to 20GHz for E5071C-2D5
E5071CU-460	from 4.5GHz to 6.5GHz for E5071C-440
E5071CU-465	from 4.5GHz to 6.5GHz for E5071C-445
E5071CU-480	from 4.5GHz to 8.5GHz for E5071C-440
E5071CU-481	from 6.5GHz to 8.5GHz for E5071C-460
E5071CU-485	from 4.5GHz to 8.5GHz for E5071C-445
E5071CU-486	from 6.5GHz to 8.5GHz for E5071C-465
E5071CU-4D5	from 8.5GHz to 14GHz for E5071C-480/485
E5071CU-4K5	from 8.5GHz to 20GHz for E5071C-480/485
E5071CU-4K6	from 14GHz to 20GHz for E5071C-4D5

b) Add bias tees¹

E5071CU-100	Add bias tees for E5071C-240
E5071CU-101	Add bias tees for E5071C-280
E5071CU-102	Add bias tees for E5071C-440
E5071CU-103	Add bias tees for E5071C-480
E5071CU-104	Add bias tees for E5071C-260
E5071CU-105	Add bias tees for E5071C-460

c) Lower frequency limit upgrade²

E5071CU-200	Lower limit upgrade from 100 kHz to 9 kHz for E5071C-245
E5071CU-201	Lower limit upgrade from 100 kHz to 9 kHz for E5071C-285
E5071CU-202	Lower limit upgrade from 100 kHz to 9 kHz for E5071C-445
E5071CU-203	Lower limit upgrade from 100 kHz to 9 kHz for E5071C-485
E5071CU-204	Lower limit upgrade from 100 kHz to 9 kHz for E5071C-265
E5071CU-205	Lower limit upgrade from 100 kHz to 9 kHz for E5071C-465

d) Measurement port upgrade

E5071CU-300	Port up from 2 ports to 4 ports for E5071C-240
E5071CU-301	Port up from 2 ports to 4 ports for E5071C-245
E5071CU-302	Port up from 2 ports to 4 ports for E5071C-280
E5071CU-303	Port up from 2 ports to 4 ports for E5071C-285
E5071CU-304	Port up from 2 ports to 4 ports for E5071C-2K5
E5071CU-305	Port up from 2 ports to 4 ports for E5071C-260
E5071CU-306	Port up from 2 ports to 4 ports for E5071C-265
E5071CU-307	Port up from 2 ports to 4 ports for E5071C-2D5

1. Minimum frequency changes from 9 kHz to 100 kHz.
2. Bias tees are removed.

e) Add high stability time base option

E5071CU-1E5 Add high stability time base

f) Add removable hard disk drive feature

E5071CU-017 Upgrade to removable hard disk drive. E5071CU-017 is only applicable for the instrument with S/N MY461xxxxx and it will be discontinued on 1 Oct. 2011. New hard disk is not included in this option and an original disk is reused. Order E5071CU-018 if spare disk is necessary.

E5071CU-018³ Hard disk drive kit, applicable for E5071C S/N MY461xxxxx and will be discontinued on 1 Oct. 2011.

E5071CU-028³ Hard disk drive kit for E5071C S/N MY462xxxxx (spare hard disk, customer installable)

g) CPU upgrade

E5071CU-040 Upgrade digital HW module, from 1.3GHz CPU to 1.86GHz

E5071C Test set option table

Frequency range & bias tees	Number of test ports	
	2-port	4-port
9 kHz to 4.5 GHz without bias tees	240	440
100 kHz to 4.5 GHz with bias tees	245	445
9 kHz to 6.5 GHz without bias tees	260	460
100 kHz to 6.5 GHz with bias tees	265	465
9 kHz to 8.5 GHz without bias tees	280	480
100 kHz to 8.5 GHz with bias tees	285	485
300 kHz to 14 GHz with bias tees	2D5	4D5
300 kHz to 20 GHz with bias tees	2K5	4K5

- When upgrading the maximum frequency, number of ports, bias-tees or lower frequency limit, please be aware that the upgrade options listed in the "E5071C Hardware upgrade option matrix" need to be ordered as well (e.g. To upgrade the unit from Opt. 240 to Opt. 480, order "E5071CU-300" and "E5071CU-480" respectively).
- "Add high stability time base" and "Upgrade to removable HDD" can be ordered at the same time as the upgrade options for frequency, number of ports, bias-tees or lower frequency limit.

3. When using E5071CU-018, E5071C-017 or E5071CU-028 removable hard disk drive is required.

E5071C Hardware upgrade options matrix

From	To	Upgrade options to order	From	To	Upgrade options to order	
240	245	E5071CU-100	280	285	E5071CU-101	
	260	E5071CU-260		480	E5071CU-302	
	265	E5071CU-100 + E5071CU-265		485	E5071CU-101 + E5071CU-303	
	280	E5071CU-280		2D5	E5071CU-2D5	
	285	E5071CU-100 + E5071CU-285		4D5	E5071CU-2D5 + E5071CU-307	
	440	E5071CU-300		2K5	E5071CU-2K5	
	445	E5071CU-100 + E5071CU-301		4K5	E5071CU-2K5 + E5071CU-304	
	460	E5071CU-260 + E5071CU-305		285	280	E5071CU-201
	465	E5071CU-100 + E5071CU-265+ E5071CU-306			480	E5071CU-201 + E5071CU-302
	480	E5071CU-280 + E5071CU-302			485	E5071CU-303
	485	E5071CU-100 + E5071CU-285+ E5071CU-303			2D5	E5071CU-2D5
	2D5	E5071CU-280 + E5071CU-2D5			4D5	E5071CU-303 + E5071CU-4D5
	4D5	E5071CU-280 + E5071CU-2D5 + E5071CU-307			2K5	E5071CU-2K5
2K5	E5071CU-280 + E5071CU-2K5	4K5	E5071CU-2K5 + E5071CU-304			
4K5	E5071CU-280 + E5071CU-2K5 + E5071CU-304	2D5	2K5	E5071CU-2K6		
245	240		E5071CU-200	4D5	E5071CU-307	
	260		E5071CU-200 + E5071CU-260	4K5	E5071CU-2K6 + E5071CU-304	
	265	E5071CU-265	2K5	4K5	E5071CU-304	
	280	E5071CU-200 + E5071CU-280		440	445	E5071CU-102
	285	E5071CU-285	460		E5071CU-460	
	440	E5071CU-200 + E5071CU-300	465		E5071CU-102 + E5071CU-465	
	445	E5071CU-301	480		E5071CU-480	
	460	E5071CU-200 + E5071CU-260 + E5071CU-305	485		E5071CU-102 + E5071CU-485	
	465	E5071CU-265 + E5071CU-306	4D5		E5071CU-480 + E5071CU-4D5	
	480	E5071CU-200 + E5071CU-280 + E5071CU-302	4K5	E5071CU-480 + E5071CU-4K5		
	485	E5071CU-285 + E5071CU-303	445	440	E5071CU-202	
	2D5	E5071CU-285 + E5071CU-2D5		460	E5071CU-202 + E5071CU-460	
	4D5	E5071CU-285 + E5071CU-2D5 + E5071CU-307		465	E5071CU-465	
2K5	E5071CU-285 + E5071CU-2K5	480		E5071CU-202 + E5071CU-480		
4K5	E5071CU-285 + E5071CU-2K5 + E5071CU-304	485		E5071CU-485		
260	265	E5071CU-104	4D5	E5071CU-485 + E5071CU-4D5		
	280	E5071CU-281	4K5	E5071CU-485 + E5071CU-4K5		
	285	E5071CU-104 + E5071CU-286	460	465	E5071CU-105	
	460	E5071CU-305		480	E5071CU-481	
	465	E5071CU-104 + E5071CU-306		485	E5071CU-105 + E5071CU-486	
	480	E5071CU-281 + E5071CU-302		4D5	E5071CU-481 + E5071CU-4D5	
	485	E5071CU-104 + E5071CU-286 + E5071CU-303	4K5	E5071CU-481 + E5071CU-4K5		
	2D5	E5071CU-281 + E5071CU-2D5	465	460	E5071CU-205	
	4D5	E5071CU-281 + E5071CU-2D5 + E5071CU-307		480	E5071CU-205 + E5071CU-481	
	2K5	E5071CU-281 + E5071CU-2K5		485	E5071CU-486	
	4K5	E5071CU-281 + E5071CU-2K5 + E5071CU-304		4D5	E5071CU-486 + E5071CU-4D5	
265	260	E5071CU-204		4K5	E5071CU-486 + E5071CU-4K5	
	280	E5071CU-204 + E5071CU-281	480	485	E5071CU-103	
	285	E5071CU-286		4D5	E5071CU-4D5	
	460	E5071CU-204 + E5071CU-305		4K5	E5071CU-4K5	
	465	E5071CU-306	485	480	E5071CU-203	
	480	E5071CU-204 + E5071CU-281 + E5071CU-302		4D5	E5071CU-4D5	
	485	E5071CU-286 + E5071CU-303		4K5	E5071CU-4K5	
	2D5	E5071CU-286 + E5071CU-2D5		4D5	4K5	E5071CU-4K6
	4D5	E5071CU-286 + E5071CU-2D5 + E5071CU-307			UNQ	1E5
	2K5	E5071CU-286 + E5071CU-2K5	019			017
	4K5	E5071CU-286 + E5071CU-2K5 + E5071CU-304				

Application and product notes

Introduction to the Fixture Simulator Function of the ENA Series RF Network Analyzers: Network De-embedding/Embedding and Balanced Measurement, Product Note E5070/71-1 Literature number 5988-4923EN

Evolution of Test Automation Using Built-in VBA with the ENA Series RF Network Analyzers, Product Note E5070/71-2 Literature number 5988-6192EN

On-wafer Multiport Calibration Using the ENA Series RF Network Analyzer with the Cascade Microtech Probing System, Product Note E5070/71-3 Literature number 5988-5886EN

In-Fixture Characterization Using the ENA Series RF Network Analyzer with Cascade Microtech Probing System, Product Note E5070/71-4 Literature number 5988-6522EN

Improve the Circuit Evaluation Efficiency of Wireless LAN Chip Set Design, Application Note 1463-2 Literature number 5988-9803EN

Impedance Characteristic Evaluation of SMD by Using the ENA with Inter-Continental Microwave (ICM) Application Note 1463-5 Literature number 5989-0547EN

Accurate Mixer Measurements Using the Frequency-Offset Mode, Application Note 1463-6 Literature number 5989-1420EN

7 Reasons to Migrate from Your 8753 to an ENA Network Analyzer Application Note 1478 Literature number 5989-0206EN

Multiport Solutions for E5071C ENA RF Network Analyzers Using External Switches Literature number 5989-7916EN

Advanced Measurement Techniques for RF Amplifiers Using Unique Functions of the Agilent E5071C ENA Literature number 5989-6522EN

Measurement Wizard Assistant software for ENA/E5091A Literature number 5989-4855EN

Comprehensive Multiport Solution for the ENA Network Analyzer Literature number 5989-8737EN

E5071C ENA Option TDR Enhanced Time Domain Analysis Option Literature number 5990-5237EN

Correlation between TDR oscilloscope and VNA generated time domain waveform Literature number 5990-5238EN

Literature and information

ENA Network Analyzers Brochure Literature number 5989-5478EN

ENA Network Analyzers Data Sheet Literature number 5989-5479EN

Agilent Network Analyzer Selection Guide Literature number 5989-7603EN

ENA-L RF Network Analyzers Brochure Literature number 5989-0167EN

ENA-L RF Network Analyzers Data Sheet Literature number 5989-0018EN

Test Solutions for Multiport and Balanced Devices Selection Guide Literature number 5988-2461EN

Agilent RF & MW Test Accessories Catalog Literature number 5968-4314EN

Key web resources for additional information on the ENA Series, visit:

www.agilent.com/find/ena



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