Keysight Technologies
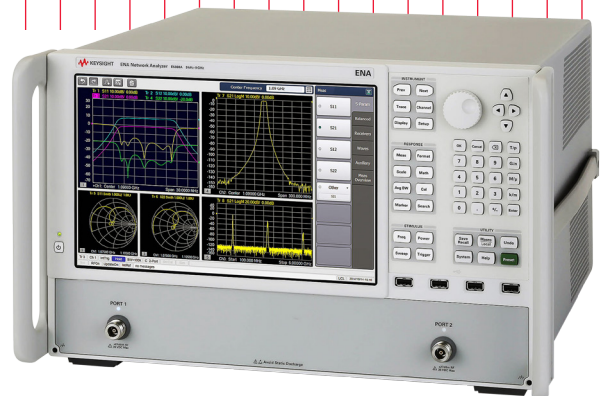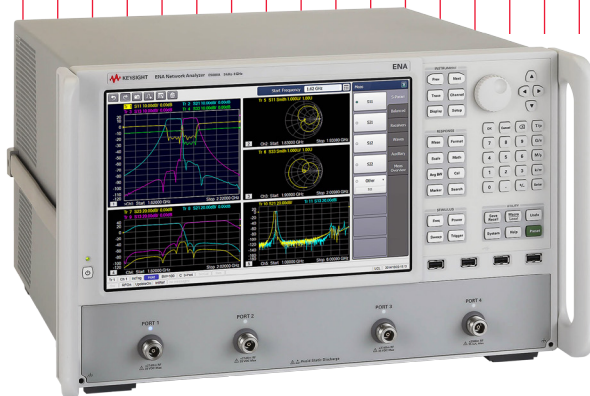
E5080A ENA Vector Network Analyzer
– 9 kHz to 4.5/6.5/9 GHz

E5092A Configurable Multiport Test Set

Configuration Guide

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This configuration guide describes standard configurations, options, accessories and peripherals for the E5080A vector network analyzer. Refer to the E5080A brochure for a complete description of the E5080A network analyzer and the E5092A configurable multiport test set.

E5080A ENA Vector Network Analyzer

The E5080A is an integrated network analyzer with a two- or four-port S-parameter test set, a synthesized RF source, a 12.1-inch color LCD, and a solid state drive. A 3-year return-to-Keysight Technologies, Inc. service warranty is included with the each ENA network analyzer.

Frequency and test set options

Choose one of the frequency and test set options. Option 2xx indicates two test ports. Option 4xx indicates four test ports.

Option Number	Description
E5080A-245	9 kHz to 4.5 GHz with bias tees, 2-port S-parameter test set
E5080A-265	9 kHz to 6.5 GHz with bias tees, 2-port S-parameter test set
E5080A-295	9 kHz to 9 GHz with bias tees, 2-port S-parameter test set
E5080A-445	9 kHz to 4.5 GHz with bias tees, 4-port S-parameter test set
E5080A-465	9 kHz to 6.5 GHz with bias tees, 4-port S-parameter test set
E5080A-495	9 kHz to 9 GHz with bias tees, 4-port S-parameter test set

Hardware options

Option Number	Description	Additional Information
E5080A-1E5	High stability time base	Adds higher stability time base reference. Must choose either option 1E5 or UNQ.
E5080A-UNQ	Standard stability time base	Must choose either option 1E5 or UNQ.
E5080A-017	Removable solid state drive	Provides a removable solid state drive for secure environments. Order the E5080AU-018 solid state drive kit for a spare disk. Must choose either option 017 or 019.
E5080A-019	Standard solid state drive	Provides a fixed solid state drive. The removable disk drive is not available. Must choose either option 017 or 019.

Application software

Product Number	Description	Additional Information
S96007A[1]	Automatic fixture removal	
S96010A[1]	Time domain analysis	
S96082A[1]	Scalar mixer/converter measurements	Provides ability to independently set the frequency of internal sources and receivers, and to configure external sources[2]. Provides scalar and vector mixer calibration.
S96086A[1]	Gain-compression measurements	
S96790A[1]	Measurement wizard assistant software	Recommended for multiport measurements using the E5092A configurable multiport test set[3].
BV9001B	BenchVue complete control collection	Simple to connect, control instruments, and automate test sequences.

1. Supported software license types: fixed-perpetual (1FP), transportable-perpetual (1TP), fixed-1-year (1FL), and transportable-1-year (1TL)
2. Order the 82357B USB/GPIB interface if you want the E5080A to control external sources via GPIB interface.
3. A 4-port ECal module (i.e. N4431B or N4433A) is required for multiport measurements.
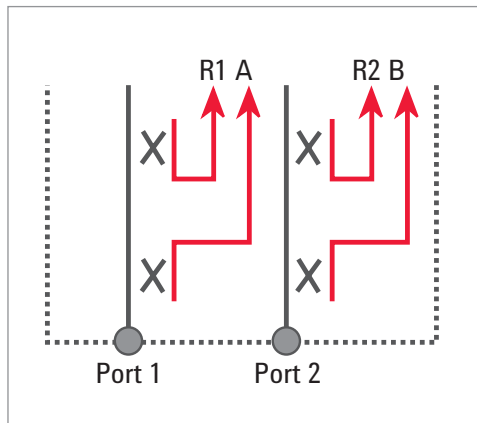
Accessories, calibration options

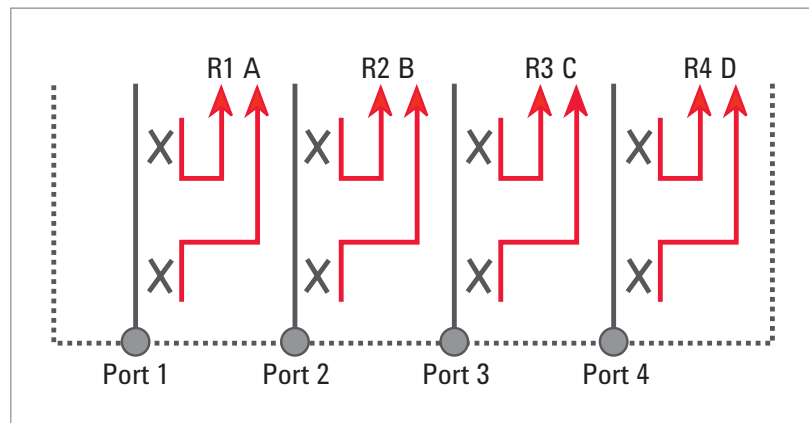| Option Number	Description	Additional Information
Accessories		
E5080A-1CM	Rack mount kit	Adds a rack mount kit (part number: 1CM042A and E3663AC)
E5080A-1CP	Rack mount kit and front handle kit	Adds a rack mount and front handle kit (part number: 1CM020A, E3663AC and 5063-9237)
E5080A-810	Add a keyboard	
E5080A-820	Add a mouse	
Calibration documents		
E5080A-1A7	ISO 17025 complaint calibration	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.
E5080A-A6J	ANSI Z540 compliant calibration	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.
Warranty assurance plan, Calibration assurance plan		
R-51B-001-5Z	Warranty assurance plan - Return-to-Keysight, 5 years	
R-51B-001-7Z	Warranty assurance plan - Return-to-Keysight, 7 years	
R-51B-001-10Z	Warranty assurance plan - Return-to-Keysight, 10 years	
R-50C-001-3	Calibration assurance plan - Return-to-Keysight, 3 years	
R-50C-001-5	Calibration assurance plan - Return-to-Keysight, 5 years	
R-50C-001-7	Calibration assurance plan - Return-to-Keysight, 7 years	
R-50C-001-10	Calibration assurance plan - Return-to-Keysight, 10 years	

Documentation

All documentation of the E5080A ENA Vector Network Analyzer is available on the web:
www.keysight.com/find/e5080a

Receiver assignment

2-port test set option

4-port test set option

Measurement application software

Automatic fixture removal (S96007A)

Many devices do not have coaxial connectors and are put in fixtures in order to measure them in a coaxial environment. Accurately removing the effects of the fixture is required to get a good measurement of the device under test (DUT). This application adds a powerful application wizard to guide you through characterizing a fixture and removing it from the measurement. Devices can be single ended or differential. Files can be saved in a variety of formats for later use in ENA, PNA, ADS, and PLTS.

Time domain analysis (S96010A)

This application enables the analyzer to view reflection and transmission responses in time or distance. Use time domain to tune filters, gate out the response of fixtures and cables, characterize the impedance of transmission lines and more.

Scalar mixer/converter measurements (S96082A)

This application enables the analyzer to set the frequency of the internal source independently from where the receivers are tuned, and is required to configure an external source. This ability is important for harmonic distortion measurements of amplifiers and for measuring mixers and converters. This application delivers the highest accuracy for scalar conversion-loss/gain measurements by combining one-port and power-meter calibrations to remove mismatch errors. A vector mixer calibration is also included for measuring group delay of frequency converting devices.

Gain compression measurements (S96086A)

The gain compression application (GCA) provides input power, output power, gain, and phase at the compression point of an amplifier over a specified frequency range. GCA's SMART Sweep is very fast and easy-to-use. GCA also includes a guided calibration that corrects for absolute power levels, frequency response, and mismatch errors.

Measurement wizard assistant (S96790A)

The application provides a simple measurement procedure setup for the 4-port E5080A with the E5092A configurable multiport test(s). The software provides an easy-to-use measurement wizard that includes a calibration wizard setup, which reduces operation time for complicated, time-consuming multiport measurements. A 4-port ECal module (i.e. N4431B or N4433A) is required for calibration wizard.

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 (E5071C and E5080A). Multiple multiport measurement configurations, from 50 MHz to 20 GHz, can be made by connecting the included semi-rigid cables to the E5092A's front panel which accesses its internal switches.

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

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
E5092A-09A	Cable and adapters for connection to E5080A Option 445/465/495

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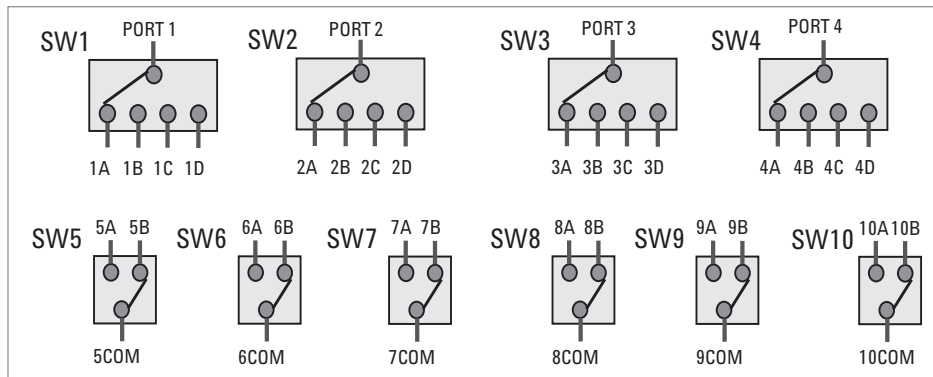
E5092A-1A7	ISO 17025 compliant calibration
E5092A-A6J	ANSI Z540 compliant calibration

Step 4: Choose your warranty service (optional)

5-year return-to-Keysight warranty and service

Block diagram

E5092A (Option 020)

1. Semi-rigid cables are designed for connection to the E5071C and E5080A.

Documentation

The documentation for the E5092A is located in the Online Help system for the E5071C and E5080A ENA network analyzer. The ENA Service Guide and Online Help system are also available on the Web site: www.keysight.com/find/ena

Additional product information

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

www.keysight.com/find/vna

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.
Option 09A	Cable and adapter set for E5080A Option 445/465/495 (4.5 GHz/6.5 GHz/9 GHz)	Adds SMA semi-rigid cables and type-N-to-SMA adapters for connection to the E5080A.
Accessories		
Option 1CM	Rack mount kit	Adds a rack mount kit (part number: 1CM015A) for use without handles.
Option 1CN	Front handle kit	Adds a front handle kit (part number: 1CN007A).
Option 1CP	Rack mount and front handle kit	Adds a rack mount and front handle kit (part number: 1CP008A).
Calibration documentation		
Option 1A7	ISO 17025 compliant calibration	
Option A6J	ANSI Z540 compliant calibration	
RF semi-rigid cables and docking plate for two stacked E5092As		
E5092-61671	RF semi rigid cable, port-1	
E5092-61672	RF semi rigid cable, port-2	
E5092-61673	RF semi rigid cable, port-3	
E5092-61674	RF semi rigid cable, port-4	
E5092-60103	Docking plate	
RF semi-rigid cables for two stacked E5092As in rack mount		
E5092-61633	RF semi rigid cable, port-1, rack mount	
E5092-61638	RF semi rigid cable, port-2, rack mount	
E5092-61639	RF semi rigid cable, port-3, rack mount	
E5092-61632	RF semi rigid cable, port-4, rack mount	

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

Measurement Accessories

A complete list of RF and microwave test accessories is available on our Web site:
www.keysight.com/find/mta

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 standards (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

Cables and adapter sets

Keysight 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.

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 ports
  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

– N4432A[1] 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

– N4433A[1] Microwave ECal: 300 kHz to 20 GHz, 3.5 mm, 4-ports
  Includes:
  Option 010 module with:
  N4433-60003 4 x 3.5 mm (f) ECal module

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

– N4690C 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

1. The N4432/33A with serial numbers of 01520 and above are supported by the E5080A.

– N7550A[1] Economy ECal: DC to 4 GHz, 2-ports
– N7551A[1] Economy ECal: DC to 6.5 GHz, 2-ports
– N7552A[1] Economy ECal: DC to 9 GHz, 2-ports
– N7553A[1] Economy ECal: DC to 14 GHz, 2-ports
– N7554A[1] Economy ECal: DC to 18 GHz, 2-ports
– N755xA Series includes:
  Option NMF with:
  Type-N (m) to Type-N (f) ECal module
  Option NMM with:
  Type-N (m) to Type-N (m) ECal module
  Option NFF with:
  Type-N (f) to Type-N (f) ECal module
  N7550X Option 152 adds:
  8710-1766 Type-N torque wrench

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[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)

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)

– 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

1. The E5080A must have firmware revision A.12.55.05 or above for the operation with the N755xA series ECal.
2. Special rugged female connector specifically for connecting to the network analyzer test port, but does not mate with a standard male connector.

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 ports
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

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 M0F module with:
N4691-60001 3.5 mm (f) to 3.5 mm (m) ECal module
Option 00M module with:
N4691-60002 3.5 mm (m) to 3.5 mm (m) ECal module
Option 00F module with:

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

– N7550A[1] Economy ECal: DC to 4 GHz, 2-ports
– N7551A[1] Economy ECal: DC to 6.5 GHz, 2-ports
– N7552A[1] Economy ECal: DC to 9 GHz, 2-ports
– N7553A[1] Economy ECal: DC to 14 GHz, 2-ports
– N7554A[1] Economy ECal: DC to 18 GHz, 2-ports
– N7555A[1] Economy ECal: DC to 26.5 GHz, 2-ports
– N755xA Series includes:
Option 3MF with:
3.5 mm (m) to 3.5 mm (f) ECal module
Option 3MM with:
3.5 mm (m) to 3.5 mm (m) ECal module
Option 3FF with:
3.5 mm (f) to 3.5 mm (f) ECal module
N7550X Option 151 adds:
8710-1765 3.5 mm torque wrench

1. The E5080A must have firmware revision A.12.55.05 or above for the operation with the N755xA series ECal.

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.
- 85131C[1, 3] single, semi-rigid: 3.5 mm (f) to PSC-3.5 mm (f), 81 cm, 32 inches
- 85131D[1, 3] 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
- 85131E[1, 3] single, flexible: 3.5 mm (f) to PSC-3.5 mm (f), 96.5 cm, 38 inches
- 85131F[1, 3] 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
- 85131G[1, 3] single, semi-rigid: 3.5 mm (f) to 3.5 mm (m), 53 cm, 21 inches
- 85131H[1, 3] single, flexible: 3.5 mm (f) to 3.5 mm (m), 62.2 cm, 24.5 inches
- 85134C[1] single, semi-rigid: PSC-3.5 mm (f) to 2.4 mm (f), 81 cm, 32 inches
- 85134D[1] 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
- 85134E[1] single, flexible: PSC-3.5 mm (f) to 2.4 mm (f), 96 cm, 38 inches
- 85134F[1] 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
- 85134G[1] single, semi-rigid: 2.4 mm (f) to PSC-3.5 mm (m), 53 cm, 21 inches
- 85134H[1] 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-K20 single, flexible: 3.5 mm (m) to 3.5 mm (m), 91.4 cm, 36 inches

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
- 85130C[1] 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)
- 85130D[1] 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)
- 85130F[1] 2.4 mm to 3.5 mm

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.

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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 E5080A Option x45,x65, and x95 test ports, which have Type-N (f) connectors.
3. Consider purchasing Keysight 20 mm TORQUE WRENCH 8710-1764

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 sensors[1]

Recommended for source output power calibration.
– E4416A[1] single-channel EPM-P series power meter
– E4417A[1] dual-channel EPM-P series power meter
– E4418B[1] single-channel EPM series power meter
– E4419B[1] dual-channel EPM series power meter
– N1911A[1] single-channel P-series power meter
– N1912A[1] 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/H USB power sensor, 10 MHz to 18 GHz, Type-N (m)
– U2001A/B/H USB power sensor, 10 MHz to 6 GHz, Type-N (m)
– U2002A/H USB power sensor, 50 MHz to 24 GHz, 3.5 mm (m)
– U2004A USB power sensor, 9 kHz to 6 GHz, Type-N (m)

Probes

– 85024A high-frequency probe, 300 kHz to 3 GHz

General Accessories

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 E5080A.

Monitors

– WXGA-compatible monitor

Printers

– USB printers with Microsoft Windows printer driver

Other

– 8710-1764 Torque wrench, 8 in/lb, 20 mm open end

Upgrade Kits

Upgrade kits for the E5080A

Protecting your hardware investment

The E5080A 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 E5080A, order the corresponding upgrade kit model. For further information, visit: **http://www.keysight. com/find/ena_support**

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1. Order the 82357B USB/GPIB interface to let the E5080A control a power meter via its GPIB interface.

Literature and Information

E5080A ENA Vector Network Analyzer Brochure, 5992-0290EN
E5080A ENA Vector Network Analyzer Data Sheet, 5992-0291EN
Keysight Network Analyzer Selection Guide, 5989-7603EN
Keysight RF & MW Test Accessories Catalog, 5989-8661EN
Electronic Calibration (ECal) Modules for Vector Network Analyzer Technical Overview, 5963-3743E

Web Resources

www.keysight.com/find/vna
www.keysight.com/find/ecal
www.keysight.com/find/mta
www.keysight.com/find/multiport
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