Agilent 85130C NMD 3.5 mm to Type-N Adapter Kit

Operating and Service Manual

Agilent Technologies

Notices

Manual Part Number

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CAUTION

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85130C Adapter Kit

General Information

To obtain optimum performance from this adapter kit, observe these simple precautions:

- Make connections carefully to avoid misalignment and connector damage, which will result in inaccurate measurements.
- Keep the connectors free of dirt and any particles.
- When you clean the connectors, try using compressed air first. Do not use abrasives. With a clean foam swab, apply only isopropyl alcohol.
- For more information, refer to the *Connector Care for RF and Microwave Coaxial Connectors* document. It can be viewed online by searching for part number 08510-90064 at www.agilent.com.

Description

The 85130C adapters are used when type-N devices must be attached to a 3.5 mm test set in a network analyzer system. The test set end of the adapters has a NMD-3.5 mm (f) connector while the Device Under Test (DUT) end has a precision slotless type-N connector (PSC-N).

Contents

The 85130C kit contains the following:

- Test port adapter, NMD-3.5 mm (f) to PSC-N (m) (Agilent part number 85054-60030)
- Test port adapter, NMD-3.5 mm (f) to PSC-N (f) (Agilent part number 85054-60029)
- Storage box, foam-lined
- Operating and Service Manual
- Spanner wrench

Specifications

Agilent Technologies guarantees that your adapters will equal or exceed the following specifications in the +20° to +26°C (+68° to +79°F) temperature range.

Frequency	Return Loss
DC – 8 GHz	≥ 34 dB
8 – 18 GHz	≥ 28 dB

The allowable recession of the center conductor of the NMD-3.5 mm (f) connector is –0.0006 to –0.0022 inches (–0.015 to –0.056 mm) below the mating surface of the outer conductor.

The allowable pin position for type-N connectors is:

male = –0.2075 to –0.2079 inch (–5.2705 to –5.28066 mm)

female = +0.2061 to +0.2065 inch (+5.23494 to +5.2451 mm)

In a mated pair of type-N connectors, the center conductor's mating plane is offset from the outer conductor's mating plane by 0.207 inch (5.2578 mm) in the direction of the male connector. See Figure 1 on page 3.

Zero the gages before each use by attaching the appropriate gage master to the end of the gage, torquing the connection to 12 in-lb with a 3/4 inch torque wrench, and adjusting the dial on the face of the gage so the gage reads zero.

Both type-N gages, male and female, read zero when the center conductor to outer conductor offset is nominally 0.2070 inch (5.2578 mm).

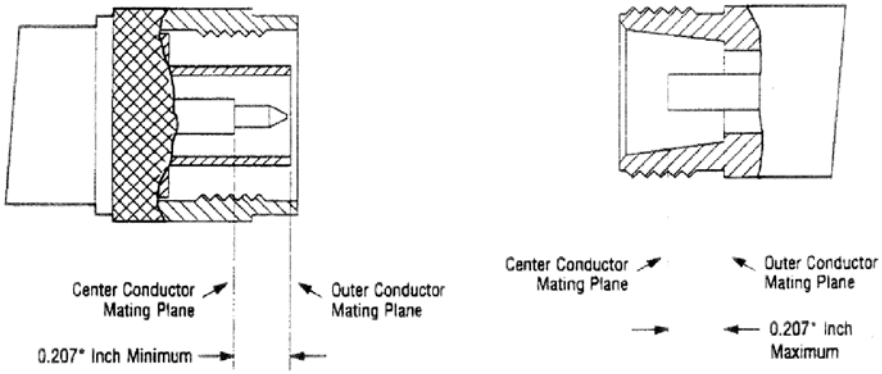
When gaging a male connector, the actual recession of the center conductor is –0.2070 inch *plus* the reading on the gage.

When gaging a female connector, the actual recession of the center conductor is +0.2070 inch *plus* the reading on the gage.

Example: for a gage reading of –0.0001 inch, the following is true:

Gage Reading	Actual Pin Position (versus outer mating plane)	
--	Male	Female
–0.0001 inch	–0.2070 + (–0.0001) = –0.2071 inch	+0.2070 + (–0.0001) = +0.2069 inch

Figure 1 Type-N Connectors



*The gage calibration blocks are manufactured to 0.2072 inches for the male and 0.2068 inches for the female. This takes into consideration the uncertainty of ±0.0002 inches (±0.005 mm) of the gage and its calibration block. Manufacturing the gages blocks this way insures that the center conductors of two mated type-N devices will never have an interference fit between them.

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Proper Use

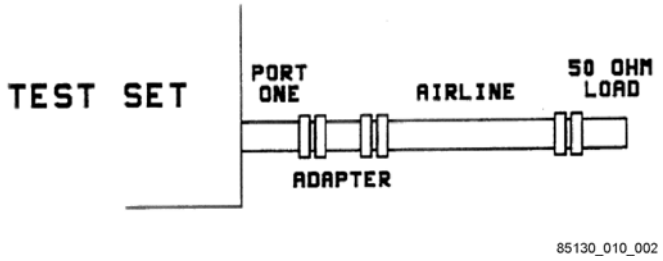
Attach the adapters to the test ports and tighten them finger tight. Use the spanner wrench to hold the test set end of the adapter and torque the test set connector with a 20 mm torque wrench set to 96 N-cm (8 in-lb).

Performance Tests

Use a network analyzer to perform the following return loss test on your adapters as soon as you receive them. Periodically repeat the test to determine if the performance meets the electrical specifications on the previous page, or if they need to be replaced. An initial period of one year between performance tests is recommended.

Required Equipment	Agilent Model or Part Number
Network analyzer – 18 GHz (or higher) measurement capability – with time domain option 010	PNA with Option 010 (See *PNA Family Microwave Network Analyzers Configuration Guide*, part number 5990-7745EN)
Type-N loads (included in the 85054B calibration kit)	00909-60011 (male) 00909-60012 (female)
Type-N 50 ohm airline, 12.5 cm (included in the 85055A verification kit)	85055-60001

Figure 2 Return Loss Setup



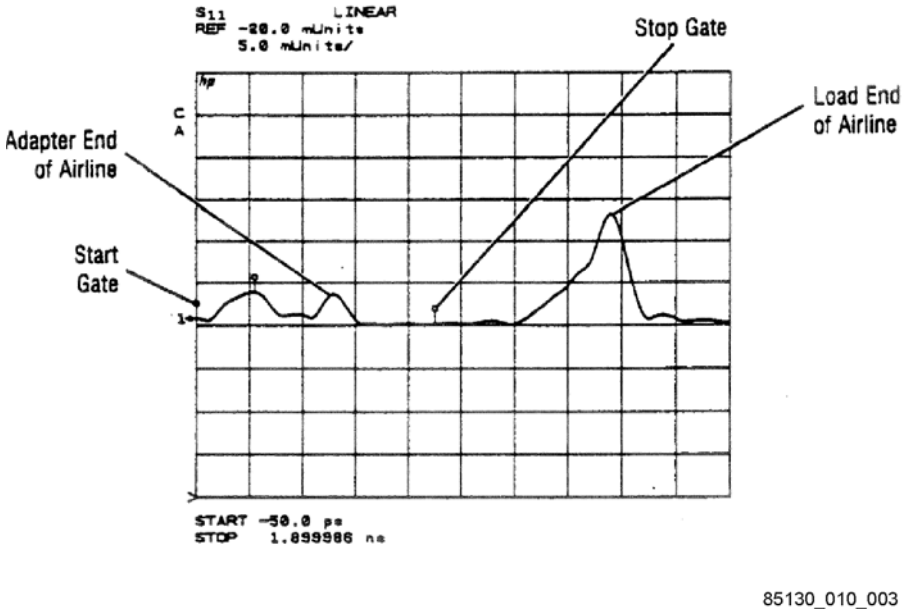
Return loss is measured by connecting a 50 ohm fixed load termination through a 12.5 cm airline to the adapter, then attaching the adapter to port one of the test set (see Figure 2).

The effects of an imperfect load may be gated out using the network analyzer time domain option.

NOTE Refer to your network analyzer's Help system for specific instructions on using the functions mentioned in the return loss test below.

1. Preset the analyzer.
2. Set a stimulus start frequency of the analyzer's lowest frequency.
3. Set a stimulus stop frequency of 18 GHz.
4. Set an IF bandwidth of 100 Hz.
5. Perform, and then save, a 3.5 mm 1-port S_{11} calibration.
6. With correction turned on, select the time domain mode.
7. Set a stimulus start time for the sweep to –0.05 nano-seconds.
8. Set a stimulus stop time for the sweep to 1.9 nano-seconds.
9. Select the gating function and gate-out everything but the adapter. See Figure 3.
10. Select the analyzer's frequency domain mode.
11. Use the markers to read the return loss value.

Figure 3 Analyzer Trace Showing Location of Gates and Airline



Performance Test Record

ELECTRICAL SPECIFICATIONS			
Tested by: _____ Date: _____			
Adapter	**Frequency Range**	**Return Loss**	**Measured**
NMD-3.5 mm (f) to PSC-N (m) and NMD-3.5 mm (f) to PSC-N (f)	DC to 8 GHz	≥ 34 dB	
	8 GHz to 18 GHz	≥ 28 dB	

Replaceable Parts

There are no replaceable components for the adapters. A worn or damaged adapter must be replaced in whole.

Equipment and Supplies

The following equipment and supplies are required for the maintenance and use of, but are not supplied with, your 85130C adapter. kit.

Item	Part Number
3.5 mm gage kit (part of the 85052B calibration kits)	85052-80010
Type-N gage kit (part of the 85054B calibration kit)	85054-80011
Torque wrench, 3/4", 136 N-cm (12 in-lb) (part of the 85054B calibration kit)	8710-1766
Torque wrench, 20 mm, 96 N-cm (8 in-lb)	8710-1764
Document: *Connector Care for RF and Microwave Coaxial Connectors*	08510-90064

Contacting Agilent

Assistance with test and measurement needs and information on finding a local Agilent office are available on the Web at:
www.agilent.com/find/assist

NOTE In any correspondence or telephone conversation, refer to the Agilent product by its model number and full serial number. With this information, the Agilent representative can determine whether your product is still within its warranty period.