Keysight 41800A Active Probe

KEYSIGHT TECHNOLOGIES

Operation Note

Notices

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Safety Notices

CAUTION

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WARNING

A **WARNING** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

1 General Information

Introduction

This section provides the specifications and the information necessary for receiving, performing an incoming inspection, and preparing the 41800A for use.

Product Description

The 41800A is an Active Probe used with network and spectrum analyzers for circuit signal analysis. The following are the main features of the 41800A.

- Wide frequency range; 5 Hz to 500 MHz
- High input impedance; 100 kΩ, 3 pF
- Used for both spectrum and network analyzers
- Protective sleeve (to protect the probe tip from ESD and physical damage)

Compatible Instruments

The 41800A can be used with the spectrum and network analyzers listed in Table 1-1 which provide a probe power supply.

Table 1-1 Compatible Instruments

Network/Spectrum/ Impedance Analyzer	Spectrum Analyzer	Network Analyzer
Keysight 4195A, 4395A, 4396B	Keysight 8590 Series, 8568B	Keysight E5100A, 3577A

Safety Considerations

The 41800A Active Probe conforms to the safety requirements for IEC 348, and CSA 556B rated instruments, and is shipped from the factory in a safe condition. This operation note contains information, **CAUTIONS** and **WARNINGS** which must be followed by the user to ensure safe operation.

Units Covered By This Operation Note

Keysight uses a two-part, ten character serial number which is stamped on the serial number plate attached to the probe. The letters and first three digits are the prefix and the last five digits are the suffix of the serial number. The letters in the serial number identifies the country where the instrument was manufactured. The prefix is same for all identical instruments, it changes only when a change is made to the instrument. The suffix, however, is assigned sequentially and is different for each instrument. This operation note applies to instruments with serial number prefixes listed under Serial Numbers on the title page.

Units manufactured after this operation note was printed may have a serial number prefix which is not listed on the title page. An unlisted serial number prefix indicates that the instrument may be different from those described in this operation note. Operation notes for new instruments may be accompanied by a yellow Manual Supplement page, or have a different part number. This supplement contains “Change Information” explaining how to adapt this operation note to newer instruments.

In addition to change information, the supplement may contain information for correcting errors (Errata) in previous operation notes. To keep this operation note as current and accurate as possible, Keysight recommends that you periodically request the latest Manual Change supplements. The supplement for this operation note is identified by the Print Date and Part Number, both of which appear on the operation note's title page.

For information concerning the serial number prefixes not listed on the title page or in the Manual Change supplements, contact your nearest Keysight sales office.

Product Contents

Table 1-2 lists the contents of the 41800A. Refer to Figure 2-1 for details.

Table 1-2 Contents of the 41800A

Description	Quantity
Probe Assembly	1
Keysight Probe-BNC (m) Adapter	1
10: 1 Divider	1
100: 1 Divider	1
Slip-on Spanner Ground Tip	1
Ground Clip (flexible)	1
Probe Tip Nut Driver (3/32 inch)	1
Keysight 10229A Hook Tip Adapter	1
Spare Probe Pin Set	1
Carrying Case	1

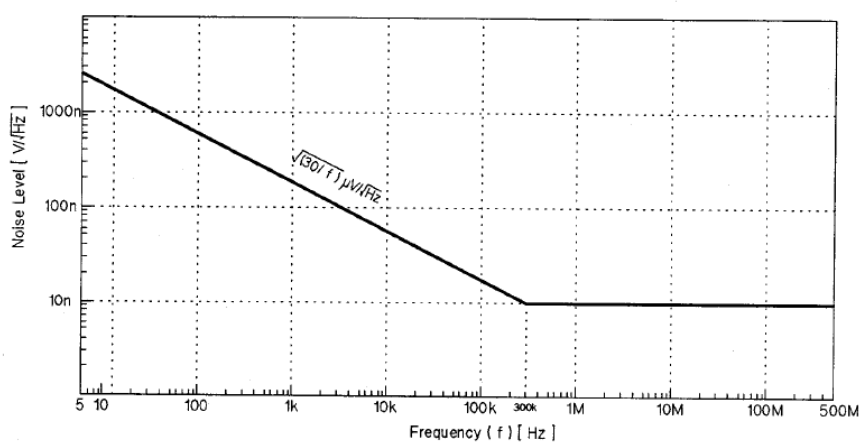
Specifications

The specifications for the 41800A Active Probe are listed below. The specifications are performance standards or limits. The 41800A meets all of the specifications listed below when it is shipped from the factory.

- Specifications describe the instrument's warranted performance over the temperature range of 23 ± 5° C (except where noted).
- The following performance is specified when the probe is terminated with a 11880A (11880-60001) Type N Adapter.
- Supplemental characteristics are intended to provide information useful in applying the instrument by giving non-warranted performance parameters. These are denoted as “typical”, “nominal”, or “approximate”.

Bandwidth:	5 Hz to 500 MHz
Probe Gain	
Probe Alone:	0 dB ±0.5 dB at 50 MHz
With 10: 1 Divider (Typical):	–20 dB ± 1 dB at 50 MHz
With 100:1 Divider (Typical):	–40 dB ±1.5 dB at 50 MHz
Input R, C (Typical)	
Probe Alone:	100 kΩ, 3 pF
With 10: 1 Divider:	1 MΩ, 1.5 pF
With 100: 1 Divider:	1 MΩ, 1 pF
Frequency Response Relative to 50 MHz	
Probe Alone:	+1/–2 dB at <50 Hz ±1 dB at 50 Hz to 200 MHz +1.5/–2 dB at >200 MHz
With 10:1 Divider (Typical):	+1.5/–2.5 dB at <50 Hz ±1.5 dB at 50 Hz to 200 MHz +2/–2.5 dB at >200 MHz
With 100:1 Divider (Typical):	+2/–3 dB at <50 Hz ±2 dB at 50 Hz to 200 MHz +2.5/–3 dB at >200 MHz

Average Noise Level (Typical):	10 nV/√Hz at ≥300 kHz +3 dB/Oct at <300 kHz (Refer to the following figure.)



2nd Harmonic Distortion (Typical):	<–50 dBc at –20 dBm (250 MHz) input
3rd Order Intermodulation Distortion (Typical):	<–70 dBc at –26 dBm, two signals input (400 MHz, 400.5 MHz)
1 dB Gain Compression:	>+3 dBm input at 500 MHz
Maximum Allowable Input :	AC+DC: ±40 V (probe alone and probe with divider) AC: 0.5Vrms (probe alone) AC: 0.5Vrms (with 1:1 divider) AC: 5Vrms (with 10:1 divider) AC: 30Vrms (with 100:1 divider)
Output Connector:	50 Ω Type N male
Power:	+15 V/60 mA, –12.6 V/60 mA
Weight:	0.3 kg (probe alone) 2 kg (included accessories)
Length:	Approximately 1.2 m
Operating Temperature Humidity:	0 °C to 55 °C, RH ≤95% (40 °C)

Furnished Accessories:	Probe-BNC (m) Adapter
	10:1 Divider
	100: 1 Divider
	Slip-on Spanner Ground Tip
	Ground Clip (flexible)
	Probe Tip Nut Driver (3/32 inch)
	10229A Hook Tip Adapter
	Spare Probe Pin Set
	Carrying Case

2 Installation

Section Contents

This section contains the following information.

- Initial Inspection
- Power Requirements
- Mating Connector
- Environmental Requirements
- Packaging

Initial Inspection

CAUTION

Electrostatic Discharge (ESD) can damage the 41800A probe's highly sensitive input amplifier. NEVER touch the probe pin!

The 41800A Active Probe meets all of the specifications listed in "Specifications" on page 10. Upon receipt, inspect the shipping container for damage. If the shipping container or the cushioning material has been damaged, keep the container and packing material until the contents have been checked for completeness and the 41800A has been mechanically and electrically checked out.

Figure 2-1 shows the product overview of the 41800A. The procedures for checking the general electrical operation are given in SECTION 4, PERFORMANCE TEST.

If anything is missing, damaged (scratches, dents, broken connectors, etc.), or if performance does not meet the specified performance test limits, notify the nearest Keysight sales office. The Keysight sales office will immediately arrange for repair or replacement without waiting for a claim settlement.

Figure 2-1 Product Overview

Table 2-1 Product Contents

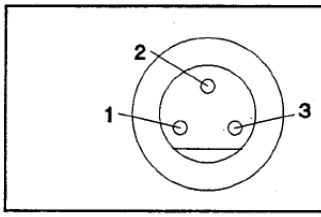
Description	Keysight Part Number	Quantity
1 Probe Assembly	PN 41800-61071[1]	1
2 Probe-BNC (m) Adapter	P/N 41800-60013	1
3 10: 1 Divider	P/N 41800-60611	1
4 100: 1 Divider	P/N 41800-60612	1
5 Slip-on Spanner Ground Tip	P/N 5060-0549	1
6 Ground Clip (flexible)	P/N 41800-61672	1
7 Probe Tip Nut Driver (3/32 inch)	P/N 8710-1806WN	1
8 1O229A Hook Tip Adapter	P/N 10229A	1
9 Spare Probe Pin Set (12 mil pin ×3, 30 mil pin ×3)	P/N 41800-60021	1
10 Carrying Case	P/N 41800-60001	1

1. Keysight internal-only part number.

Power Requirements

Power for the 41800A is supplied by the Compatible Instruments listed in Table 1-1 by connecting the 41800A's power plug to the probe power jack on the instrument. If the instrument used with the 41800A does not have a probe power supply, use a separate power supply which meets the requirements listed in Figure 2-2.

Figure 2-2 Probe Power Requirements



Pin	Voltage	Current
1	-12.6 V ±20%	60 mA
2	GND	
3	+15 V ±5%	60 mA

As looking into the probe's power plug.

When using the 41800A with the instrument that does not supply probe power, you can use the external power supply and the cable (Keysight part number: 87405-20012) to supply a power to the active probe. The cable is furnished with the 41800A when the option 41800A-001 is ordered.

Required Power Supply

One of the following Keysight external power supplies needs to be used.
E3620A, E3630A, E3631A

Cable Connection

The user needs to ensure the correct cable connection as shown below:

- Green plug of the cable - Green terminal of the power supply
- Red plug of the cable - Red terminal of the power supply
- Black plug of the cable - Black terminal of the power supply

Power Level Setting

The user needs to ensure the correct power level setting of the power supply (+15 V and -12.6 V) per attached labels on the cable. Power requirements of the 41800A are as follows:

- Green: Ground
- Red: +15 V ±5 %
- Black: -12.6 V ±20 %

WARNING Failure to comply with the descriptions in “Required power supply,” “Cable connection,” and “Power level setting” section may cause overheating or smoking of the 41800A. Keysight Technologies, Inc. assumes no liability for customer’s failure to comply with these requirements.

Mating Connectors

The output connector of the 41800A probe is a 50 Ω N-type male connector. Trying to mate this 50 Ω N-type connector to a 75 Ω N-type connector will result in damage to both connectors.

Keep the N-type output connector clean.

Environmental Requirements

The 41800A may be stored or shipped under the following environmental conditions.

- Temperature: –40 °C to +70 °C

The unit must be protected from temperature extremes which can cause condensation.

Packaging

This paragraph describes how to repackage the 41800A for shipment when necessary.

Original Packaging

Containers and packing material identical to those used in factory packaging are available from Keysight. If the unit is being returned to Keysight for servicing, attach a tag indicating the type of service required, return address, model number and full serial number.

Other Packaging

The following general instructions should be used for repacking with commercially available materials.

1. Wrap the unit in heavy paper or plastic. If shipping to a Keysight sales office or service center, attach a tag indicating the type of service required, return address, model number, and full serial number.
2. Use a strong shipping container. A double-walled carton made of 350 pound test material is adequate.
3. Use enough shock absorbing material (a 3 to 4 inch layer) around all sides of the unit to provide a firm cushion and to prevent the unit from moving around inside the container.
4. Securely seal the shipping container.
5. Mark the shipping container FRAGILE to ensure careful handling.
6. In any correspondence, refer to unit by its model number and its full serial number.

3 Operation

Section Contents

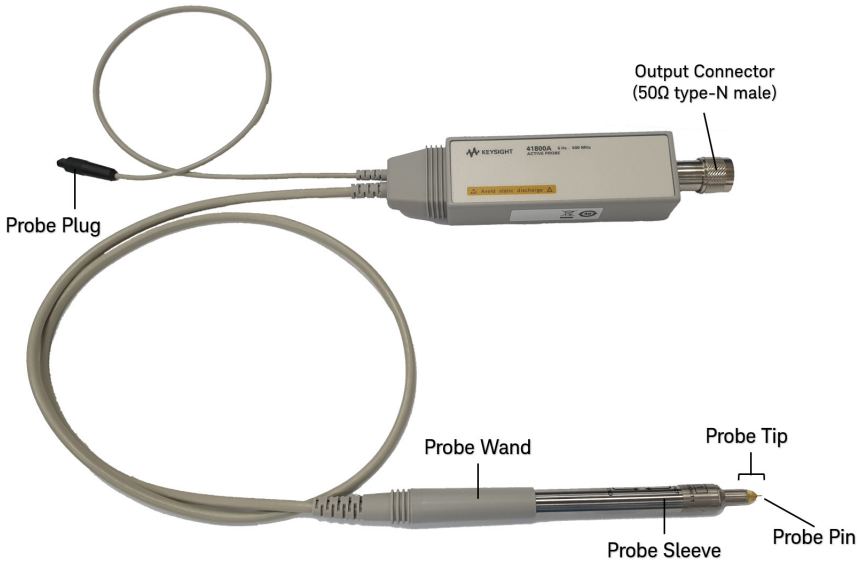
This section provides the following information.

- Overview
- Operation Precautions
- Preparation For Use
- Typical Measurement Setups
- Probe Pin Replacement

Overview

This paragraph provides a description of the probe assembly and each of its furnished accessories including their usage. Figure 3-1 shows an overview of the 41800A probe assembly and Figure 3-2 shows the accessories furnished with the 41800A.

Figure 3-1 41800A Probe Assembly



Probe Assembly (Protective Sleeve)

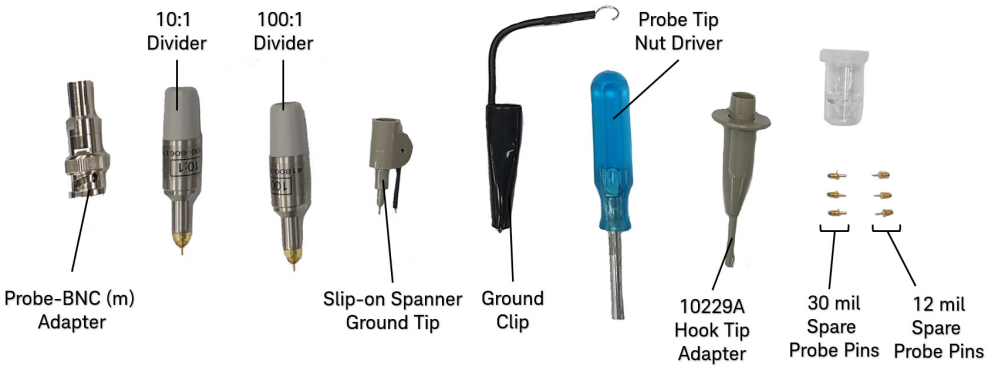
The 41800A probe assembly is equipped with a grounded protective sleeve to protect the probe tip from mechanical abuse and to reduce the chance of ESD damage. Extend the protective sleeve when not actually making measurements.

To retract the protective sleeve of the probe, perform the following procedure.

1. Hold the probe wand, pointing the pin away from you, and grasp the protective sleeve in your other hand.
2. Turn the protective sleeve counter-clockwise a little.
3. Pull the sleeve slowly toward you.
4. Turn the sleeve clockwise a little to lock it in position.

To extend the protective sleeve, perform the above steps in reverse order.

Figure 3-2 41800A Furnished Accessories



Keysight Probe-BNC(m) Adapter This is used to change the probe input to BNC(m) connector. To change the probe input to the BNC 50Ω system, insert the probe into this adapter and connect a 50Ω feed-through termination.

10:1 Divider This is used to divide the probe input level by a factor of 10. Before using this divider, the divider adjustment should be performed (refer to "Preparation for Use" on page 24).

100:1 Divider This is used to divide the probe input level by a factor of 100. Before using this divider, the divider adjustment should be performed (refer to "Preparation for Use" on page 24).

Slip-on Spanner Ground Tip This is used to ground the probe. Put this ground tip on the probe to probe a test point and a ground point simultaneously.

Ground Clip This is used to ground the probe. When a test point and a ground point cannot be probed simultaneously, put this ground clip on the probe and connect the alligator clip of the ground clip to a ground point.

NOTE Select the grounding devices (slip-on spanner ground tip and ground clip) for as short a ground path as possible. The effects of improper grounding become greater as the frequency increases. For optimum measurements in a factory environment, design your circuits with ground plane feedthroughs next to each test point.

Probe Tip Nut Driver	This is used to replace the probe pin. Refer to "Probe Pin Replacement" on page 36.
10229A Hook Tip Adapter	This is used to hook on to the test point of the device under test.
Probe Pins	Two kinds of probe pins, 12 mil pin and 30 mil pin, are available for the 41800A. Three 12 mil pins and three 30 mil pins are furnished with the 41800A as spare probe pin set. The 41800A is shipped from the factory with a 30 mil pin installed. The 30 mil probe pin must be used, when using with the Keysight probe-BNC(m) adapter, the 10:1 / 100:1 dividers, the slip-on spanner ground tip, the hook tip adapter. To replace the probe pin, refer to "Probe Pin Replacement" on page 36.

Operating Precautions

This paragraph describes precautions for using the 41800A to prevent from damage on the 41800A and your Device Under Test (DUT).

Anti-static Precautions

The 4180OA is sensitive to electrostatic discharge (ESD). The followings must be adhered to when using the 41800A.

- **Do NOT touch the probe pin:**
  The probe input circuit is highly susceptible to damage by ESD introduced through the probe pin.
- **Eliminate ESD on your body:**
  Wear a snug-fitting ground strap that is connected to earth ground through a 1 MΩ resistor.
- **Eliminate ESD on the work surface:**
  A grounded anti-static bench mat is recommended. Optional floor mats provide an extra measure of protection, especially in areas with floor carpet. Do NOT use the 41800A on a carpeted work surface.
- **Hold the probe by the protective sleeve:**
  Always hold the probe by the retracted ground protective sleeve to eliminate residual ESD on your body.
- **Do NOT introduce ESD into the OUT while the probe is in use:**
  If an unprotected person touches a part of the DUT, a static surge could damage the DUT as well as the probe.

Maximum Allowable Level

Maximum allowable level (ac+dc) to the probe is ±50 V (±200 V when used with a divider).

Discharging The Probe

Measuring a node having a DC voltage potential charges the blocking capacitors inside the 41800A probe. Ground the probe pin after measuring such nodes to discharge probe capacitor. Failure to do this could result in damage to sensitive circuits in the DUT, especially if it is an active device.

Preparation for Use

This paragraph provides the 41800A operating check procedure and the 10:1/100:1 divider adjustment procedure.

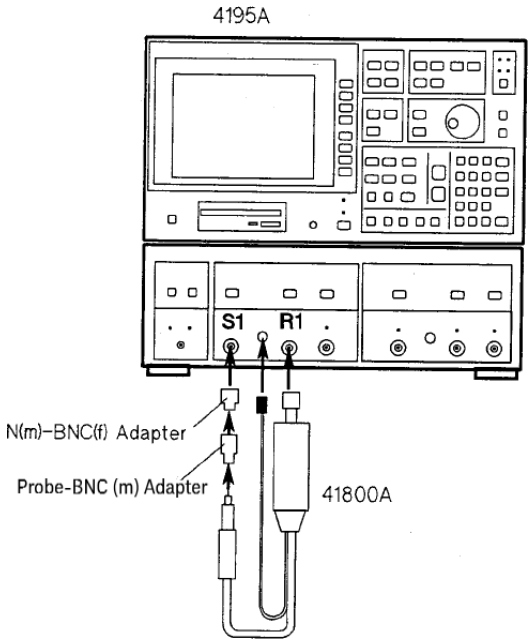
The 41800A operating check procedure checks the probe gain using the network/spectrum analyzer, a network analyzer, or a spectrum analyzer. These operating check procedures are only intended to ensure that the 41800A is functional. If the 41800A fails this check, it should be repaired. To verify that the 41800A meets its specifications, perform the PERFORMANCE TEST described in SECTION 4.

The 10:1/100:1 divider adjustments should be performed to minimize the frequency response error due to the 10:1/100:1 dividers (furnished with the 41800A). Performing these adjustments are recommended before using the 10:1 and 100:1 dividers.

Operating Check Using the Keysight 4195A

Figure 3-3 shows the operating check setup using the Keysight 4195A network/spectrum analyzer.

Figure 3-3 Operating Check Setup Using the Keysight 4195A



Equipment

• Network/Spectrum Analyzer	Keysight 4195A
• Probe-BNC(m) Adapter	As shipped
• Adapters	As necessary

Procedure

1. Connect the equipment as shown in Figure 3-3.
2. Set up the Keysight 4195A as follows.

CONFIG	SPECTRUM
PORT SELECT	SOURCE CH1 on
CENTER	50 MHz
SPAN	0 Hz
AMPLITUDE (S1)	–26 dBm
REF ATTEN (R1)	10 dB

3. Confirm that the signal level is **–20 dBm ± 5 dB**.

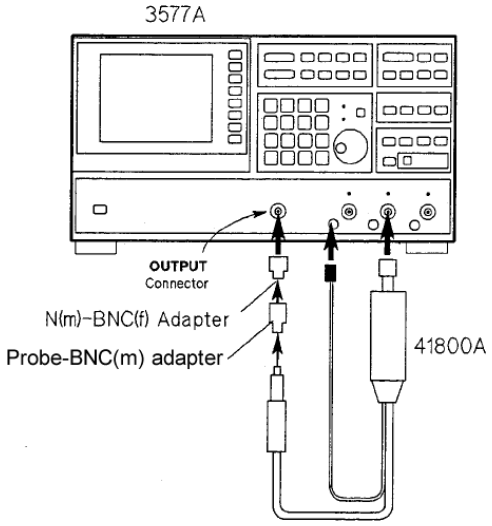
NOTE

The Keysight 11880A (11880-60001) probe-N(m) adapter can be used instead of the N(m)-BNC(f) adapter and the Keysight probe-BNC(m) adapter. The signal level should be –26 dBm ± 5 dB when the Keysight 11880A (11880-60001) probe-N(m) adapter is used.

Operating Check Using a Network Analyzer

Figure 3-4 shows the operating check setup using a network analyzer. To check the probe gain, absolute power amplitude measurement mode should be selected.

Figure 3-4 Operating Check Setup Using a Network Analyzer



Equipment

- Network Analyzer — Any compatible
- Probe-BNC(m) Adapter — As shipped
- Adapters — As necessary

Procedure

1. Connect the equipment as shown in Figure 3-4.
2. Set up the network analyzer as follows.

Measurement Mode	R, A, or B (absolute amplitude measurement)
Center Frequency	50 MHz
Span	0 Hz
Output Level	–10 dBm

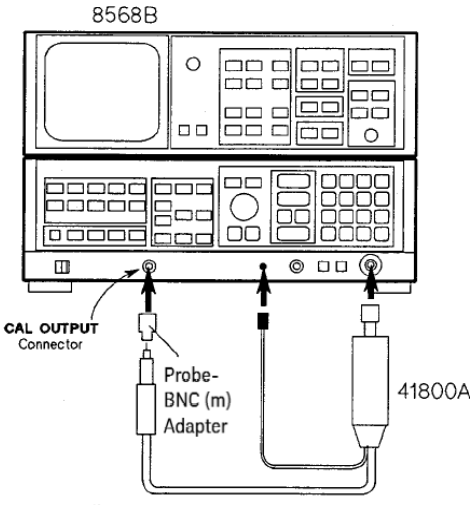
3. Confirm that the signal level is **–4 dBm ± 5 dB**.

NOTE The Keysight 11880A (11880-60001) probe-N(m) adapter can be used instead of the N(m)-BNC(f) adapter and the Keysight probe-BNC(m) adapter. The signal level should be –10 dBm ± 5 dB when the Keysight 11880A (11880-60001) probe-N(m) adapter is used.

Operating Check Using a Spectrum Analyzer

Figure 3-5 shows the operating check setup using a spectrum analyzer.

Figure 3-5 Operating Check Setup Using a Spectrum Analyzer



Equipment

• Spectrum Analyzer	Any compatible
• Probe-BNC(m) Adapter	As shipped
• Adapters	As necessary

Procedure

1. Connect the equipment as shown in Figure 3-5.

NOTE

If the spectrum analyzer has a tracking generator output, use the tracking generator output connector instead of the calibration output connector. Then set the output level to ≤–10 dBm.

2. Set up the spectrum analyzer as follows.

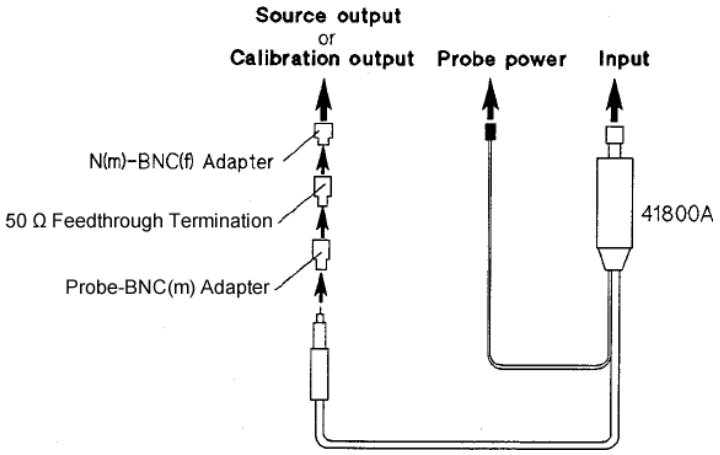
Center Frequency	Same as Calibration Output frequency
Span	0 Hz
Attenuation	40 dBm

3. Confirm that the signal level is **(calibration output level + 6 dB) ± 5 dB**.

10:1/100:1 Divider Adjustments

This adjustment procedure is used to adjust the 10:1/100:1 divider's gain. This adjustment requires the Keysight 4195A, any compatible Network Analyzer, or any compatible Spectrum Analyzer.

Figure 3-6 Divider Adjustment Setup



Equipment

• Network or Spectrum Analyzer	Any compatible
• Probe-BNC(m) Adapter	As shipped
• 50 Ω Feedthrough Termination	Any compatible
• Adapters	As necessary
• Alignment Tool (-; minus)	As necessary

Procedure

1. If you use the Keysight 4195A:
   Set CONFIG to SPECTRUM.
   Set SOURCE CH1 on.
   Set CENTER to 50 MHz, SPAN to O Hz.
   Connect the adapter, feedthrough and probe adapter to the S1 connector.

   If you use the Network Analyzer:
   Select the absolute power amplitude measurement mode (R, A, or B).
   Set CENTER to 50 MHz, SPAN to O Hz.
   Connect the adapter, feedthrough and probe adapter to the source output connector.

   If you use the Spectrum Analyzer:
   Set CENTER to the calibration output frequency.
   Set SPAN to O Hz.
   Connect the feedthrough and probe adapter to the calibration output connector.

NOTE If the spectrum analyzer has the tracking generator output, use the tracking generator output connector instead of the calibration output connector.

2. Connect the 41800A's OUTPUT connector to the instrument's INPUT connector.Insert the 41800A's probe tip into the probe adapter.
3. Note the measured value, and remember it as data **R**. Data **R** is used in steps 7 and 9.

   Data **R** = _____ dBm
4. Disconnect the 41800A from the probe adapter.

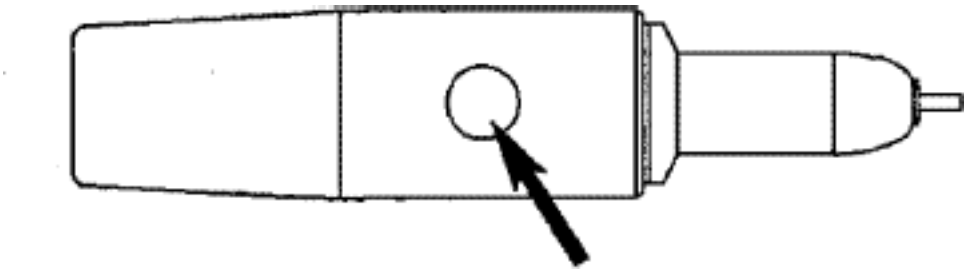
10:1 Divider Adjustment

5. Connect the 10:1 divider to the 41800A's probe tip, and insert it into the probe adapter on the instrument's input connector.
6. Adjust the trimmer component from the opening of the divider, shown in Figure 3-7, so that the data measured by the instrument is approximately 20 dB less than data **R**.

100:1 Divider Adjustment

7. Connect the 100:1 divider to the 41800A's probe tip, and insert it into the probe adapter on the instrument's input connector.
8. Adjust the trimmer component on 100:1 divider so that the data measured by the instrument is approximately 40 dB less than data **R**.

Figure 3-7 10:1/100:1 Divider Adjustment Component Location



Typical Measurement Setups

This paragraph provides typical measurement setups using the 41800A. The following setups are described.

- Network Measurement Setups
  - Using one 41800A
  - Using one 41800A with a transmission/reflection test set
  - Using two 41800A
- Spectrum Measurement Setups
  - Using the 41800A with an instrument which has a type-N input connector
  - Using the 41800A with an instrument which has a BNC input connector

CAUTION

Electrostatic Discharge (ESD) can damage the 41800A 's highly sensitive input amplifier. **Never touch the probe pin!**

Do not apply an ac+dc level which exceeds ±50 V (±200 V when using a divider) to the probe.

Do not mate the output connector of the probe assembly (50 Ω type-N connector) to 75 Ω type-N connectors or damage may result.

NOTE

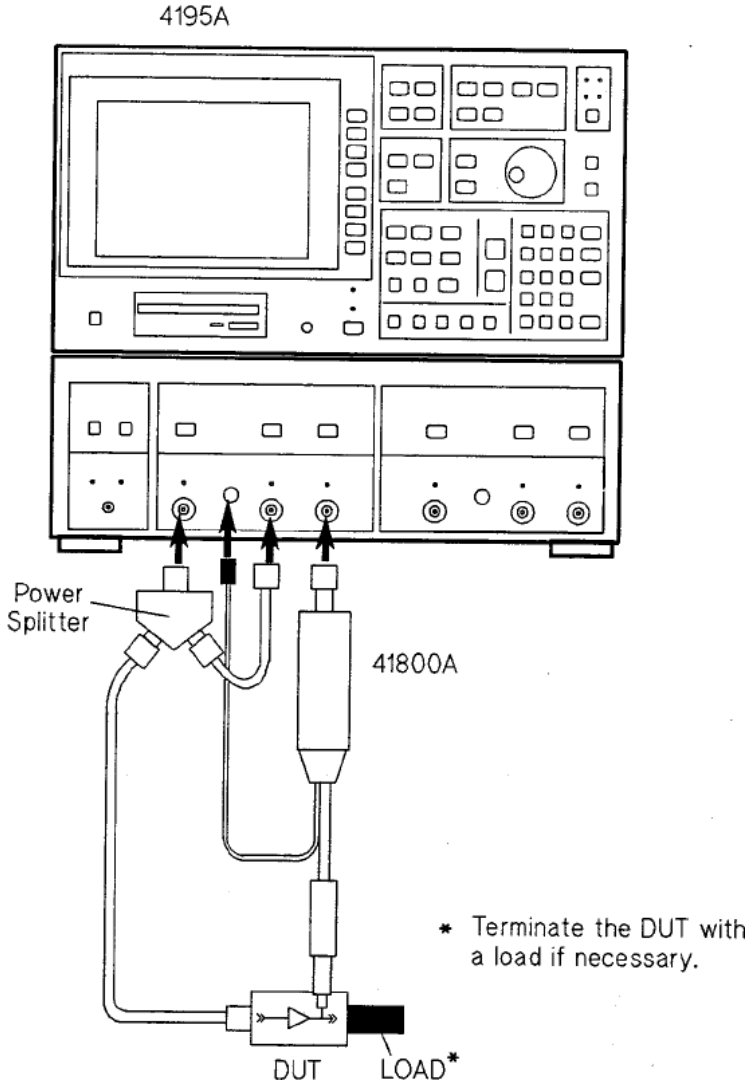
The 30 mil probe pin must be used to adapt to the Keysight probe-BNC(m) adapter, the 10:1/100:1 dividers, the slip-on spanner ground tip, the hook tip adapter, or the Keysight probe-N(m) adapter.

Network Measurements

Using One 41800A

Figure 3-8 shows a typical measurement setup for the network measurements. Place the probe tip as close to the input of the device under test, and perform a normalize (through) calibration to compensate the frequency response error.

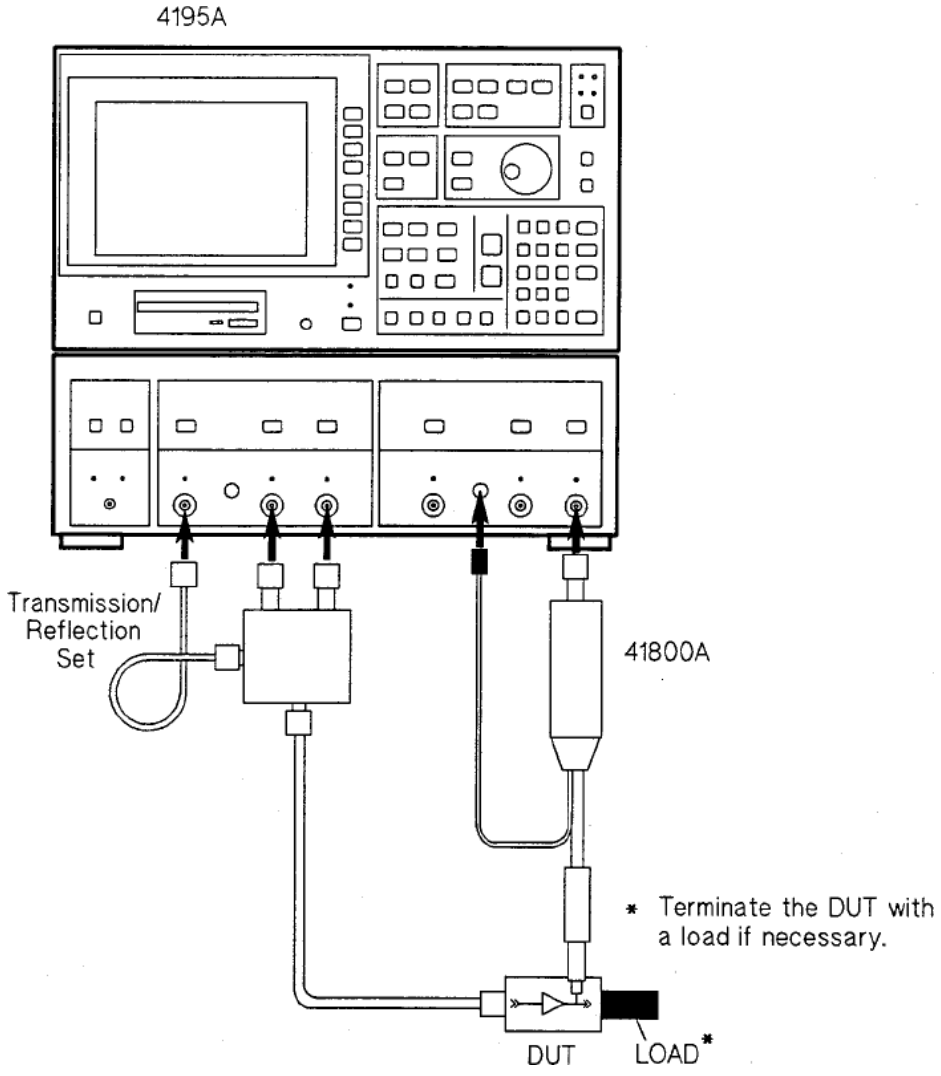
Figure 3-8 Network Measurement Setup Example (Using One 41800A)



Using One 41800A with a Transmission/Reflection Test Set

Figure 3-9 shows a typical measurement setup for the network measurements using with a transmission/reflection test set. Place the probe tip as close to the input of the device under test, and perform a normalize (through) calibration to compensate the frequency response error.

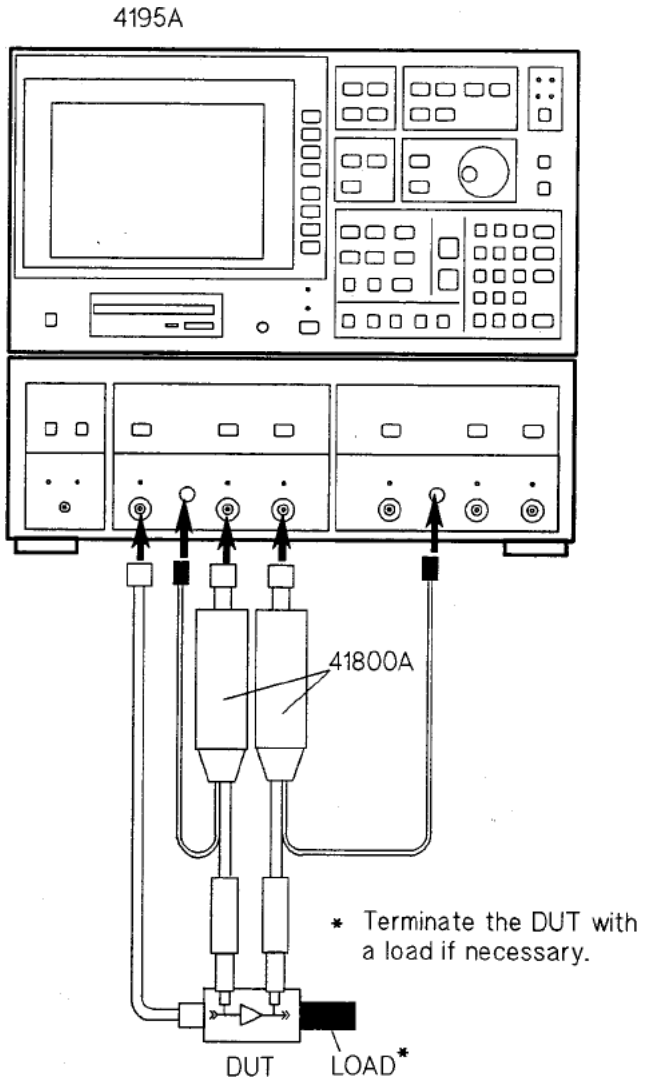
Figure 3-9 Network Measurement Setup Example (Using With A Transmission/Reflection Test Set)



Using Two 41800As

Figure 3-10 shows a typical measurement setup for the network measurements using two probes. Place the probe tip as close to the input of the device under test, and perform a normalize (through) calibration to compensate the frequency response error.

Figure 3-10 Network Measurement Setup Example (Using Two 41800As)

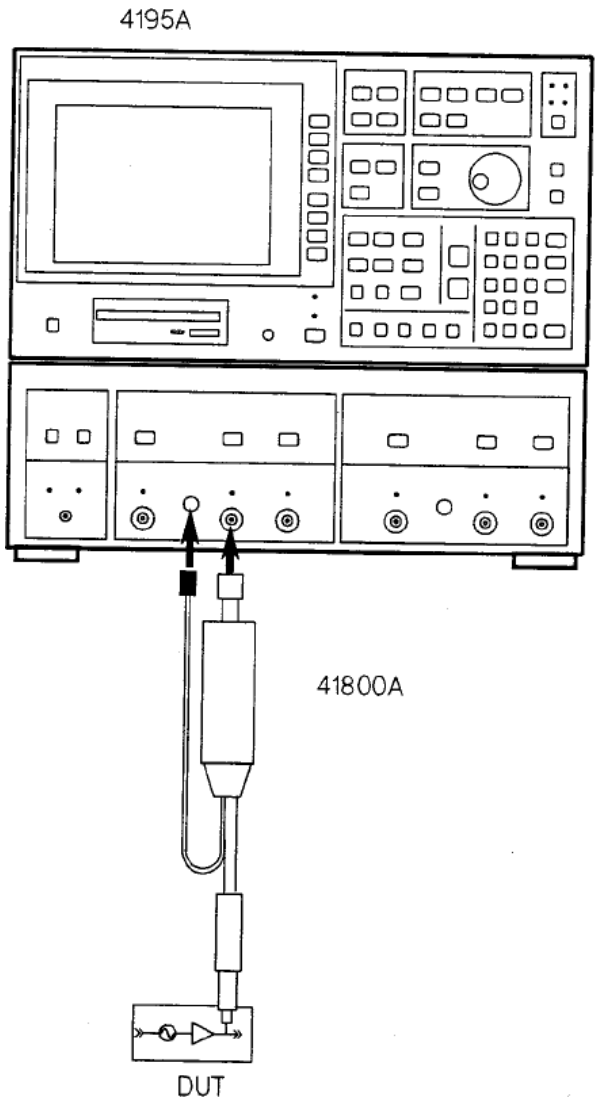


Spectrum Measurements

Using the 41800A with Instruments Which Have Type-n Connectors

Figure 3-11 shows a typical measurement setup using a spectrum analyzer which has a type-N input connector.

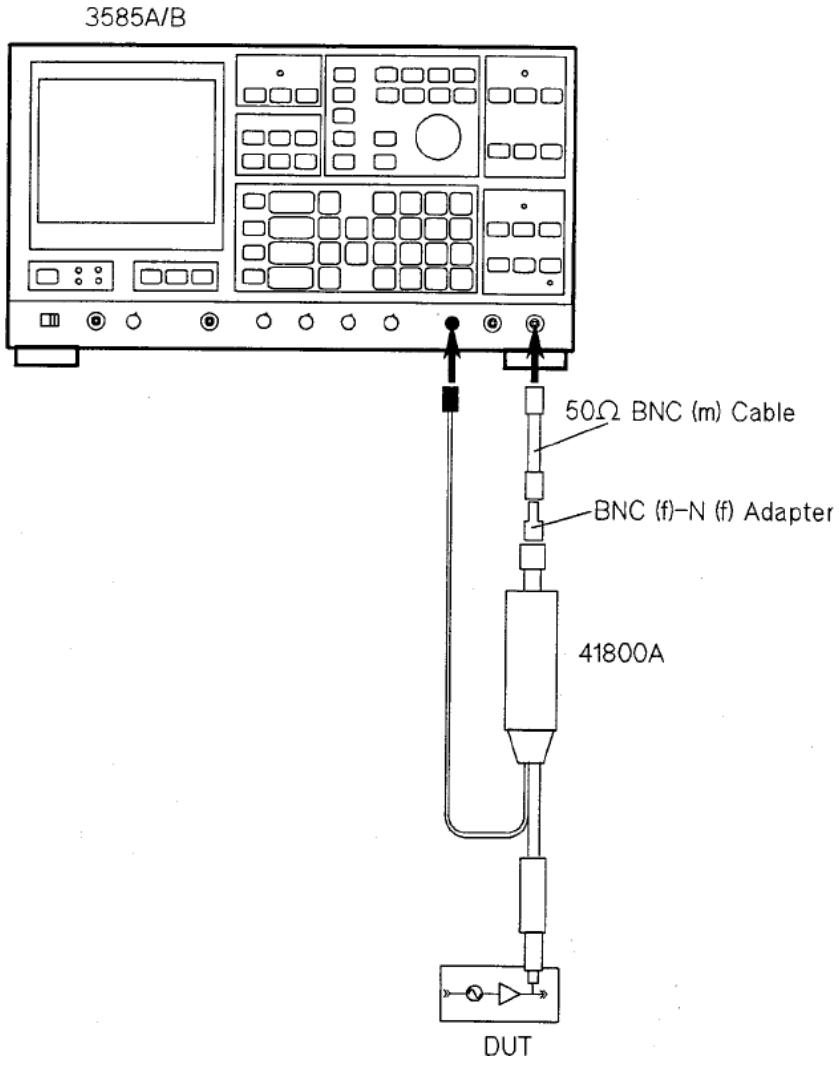
Figure 3-11 Spectrum Measurement Setup Example (Type-N Input Connector)



Using the 41800A with instruments which have BNC connectors

Figure 3-12 shows a typical measurement setup using a spectrum analyzer which has a BNC input connector. A BNC(m) cable and N(f)-BNC(f) adapter are recommended to use tor connecting the 41800A to the spectrum analyzer. Do not use an inflexible adapter such as a BNC(m)-N(f) adapter instead of the cable and N(f)-BNC(f) adapter, otherwise the overweight caused by the 41800A may damage the spectrum analyzer's connector.

Figure 3-12 Spectrum Measurement Setup Example (BNC Input Connector)



Probe Pin Replacement

This paragraph describes how to replace the probe pin.

CAUTION Electrostatic Discharge (ESD) can damage the 41800A 's highly sensitive input amplifier. Wear a snug-fitting ground strap to touch the probe pin. Do not touch the probe pin directly.

NOTE The 30 mil probe pin must be used to adapt to the Keysight probe-BNC(m) adapter, the 10:1/100:1 dividers, the slip-on spanner ground tip, the hook tip adapter, or the Keysight 11880A (11880-60001) probe-N(m) adapter.

1. Unscrew the probe pin slowly using the probe tip nut driver (PN 8710-1806WN; furnished with the 41800A).
2. Screw in the new pin with the driver.

NOTE A spare probe pin set (PN 41800-60021), includes 12 mil pins (3 ea.) and 30 mil pins (3 ea.), is available from your nearest Keysight Technologies office.

4 Performance Tests

Introduction

This section provides performance test procedures to ensure that the 41800A meets the specifications listed in "Specifications" on page 10. The performance test can be performed without accessing the interior of the 41800A.

The test results should be recorded into the Performance Test Record, which is located at the end of this section.

NOTE

The recommended models 4195A and 11880A are obsolete. The performance and adjustment test shown in this chapter are to be used as references only.

Equipment Required

The equipment required for performance testing is listed in Table 4-1. Substitutions can be made if the substitution equipment meets or exceeds the specifications listed in the Requirements column.

Table 4-1 **Recommended Test Equipment**

Equipment Recommended Model	Qty.	Requirements	Use[1]
Network Analyzer Keysight 4195A	1	No substitute	P,A,T
Power Meter Keysight 436A or 438A	1	Accuracy: ≤0.1 dB Frequency: 500 MHz	P
Power Sensor Keysight 8482A	1	Frequency: 500 MHz Compatible with the Keysight 436A or 438A	P
Power Splitter Keysight 11667A	1	Frequency Range: 5 Hz to 500 MHz	P,A

Table 4-1 Recommended Test Equipment (Continued)

Equipment Recommended Model	Qty.	Requirements	Use[1]
Probe Adapter Keysight 11880A (11880-60001)	1	No substitute[2]	P,A,T
Cable Keysight 11500B	2	N(m)-N(m), 50 Ω, 61 cm	P,A
Adapter	1	N(f)-N(f), 50 Ω	P,A
	1	N(m)-N(m), 50 Ω	P,A
Active Probe Keysight 41800A	1	Frequency: 50 MHz	T

1. P, A, and T represents the Performance Test, Adjustment, and Troubleshooting, respectively.
2. Used with N(m)-BNC(f) adapter and probe-BNC(m) adapter

Calibration Cycle

The 41800A requires periodic performance verification. The 41800A should be checked out using the performance test at least once a year or more depending on its frequency of use. Preventive maintenance should be performed at least twice a year to keep down-time to a minimum, and to insure optimum operation.

Preparation

This paragraph provides the information which you should know and the steps that you should perform before starting the performance test.

1. The test equipment must be allowed to warm-up and stabilize for at least 30 minutes.
2. A Keysight 4195A is required to test the 41800A. In the remainder of this manual, softkeys are indicated in boldface type and enclosed in single quotes (e.g., **'NETWORK'** softkey), and keys are indicated in boldface type only (e.g. **PRESET** key).

Probe Gain/Frequency Response Tests

Description

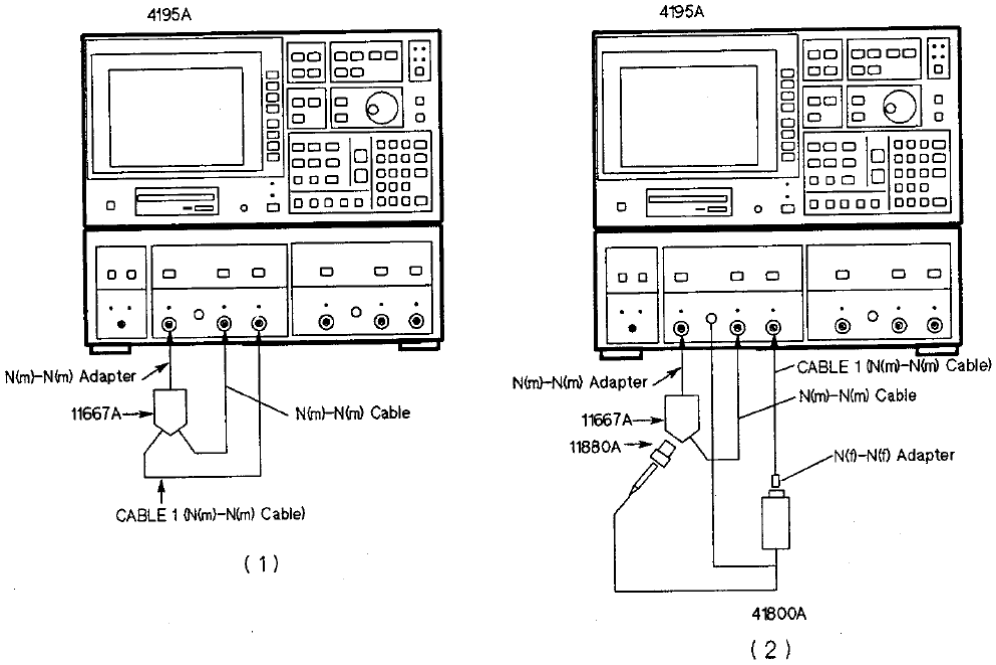
The Probe Gain/Frequency Response Test checks the probe gain at 50 MHz, and the frequency response relative to 50 MHz.

Specifications (at 23 °C ± 5 °C)

Probe Gain:	0 dB ±0.5 dB at 50 MHz
Frequency Response: (relative to 50 MHz)	+1 dB/–2 dB at <50 Hz ±1 dB at 50 Hz to 200 MHz +1.5 dB/–2 dB at >200 MHz

Setup

Figure 4-1 Probe Gain/Frequency Response Test Setup



Equipment

Network Analyzer	Keysight 4195A
Power Splitter	Keysight 11667A
Probe to N(m) Adapter	Keysight 11880A (11880-60001)
N(m)-N(m) Cable	Keysight 11500B
N(f)-N(f) Adapter	PN 1250-0777
N(m)-N(m) Adapter	PN 1250-0778

Procedure

1. Connect the power splitter to the Keysight 4195A as shown in Figure 4-1 (1).
2. Sequentially press the following Keysight 4195A front panel keys, to set the Keysight 4195A to the Probe Gain/Frequency Response test settings.

   CONFIG, 'NETWORK', PRESET

   AMPLITUDE (CHANNEL 1 side)**, -, 1, 4, ENTER/EXECUTE**

   REF ATTEN (CHANNEL 1 side)**, 0, ENTER/EXECUTE**

   TEST ATTEN (CHANNEL 1 side)**, 0, ENTER/EXECUTE**

   START, 1, 0, Hz/dBµV

   STOP, 5, 0, 0, MHz/V

   MENU, 'TRIGGER menu', 'SINGLE mode', 'return'

   'RESOLUTN menu', 'No. of POINTS', 1, 0, 1, ENTER/EXECUTE

'return', 'TYPE lin log'	(**"log"** in the **'TYPE lin log'** softkey will change to intensified green.)
DISPLAY, 'TRACE B on off'	(**"off"** in the **'TRACE B on off'** softkey will change to intensified green.)
AUTO	(The yellow LED in the **AUTO** key will turn on.)

3. Sequentially press the following Keysight 4195A front panel keys to set the Keysight 4195A's programmed points table, and to activate its program sweep measurement capability.

   MENU, 'PROGRAM sweep', 'PROG TBL set up'

   (Confirm that the displayed table is empty. If the table is not empty, press the **'TABLE No.'** softkey repeatedly until an empty table is displayed, or press the **'TABLE ALL CLR'** softkey and **ENTER/EXECUTE** key.)

(Confirm that the table sweep parameter is frequency. If it is not frequency, press the **'SWP select'** softkey repeatedly until it changes to frequency.)

'X REG dump'

(move the cursor to the N = 96 position by pressing the down arrow key)

CLR LINE, 2, 0, 0, MHz/V, ENTER/EXECUTE

(move the cursor to the N = 88 position)

CLR LINE, 5, 0, MHz/V, ENTER/EXECUTE

(move the cursor to the N = 1 O position)

CLR LINE, 5, 0, Hz/dBµV, ENTER/EXECUTE, 'set end',

'PROG SWP on off' (**“on”** in this softkey will change to intensified green.)

4. Sequentially press the following Keysight 4195A front panel keys to perform a normalize (thorough) calibration, and wait until the message “Cal completed” is displayed.

   CAL, 'TRANS CAL menu', 'NORMLIZE (THRU)', 'THRU', ENTER/EXECUTE

5. Press the Keysight 4195A's **CAL** key and the **'CORRECTN on off'** softkey to activate the Keysight 4195A's correction capability. The “**on**” in this softkey will change to intensified green.

6. Disconnect CABLE 1 (see Figure 4-1 (1)) from the power splitter, and connect the 41800A between the power splitter and CABLE 1 as shown in Figure 4-1 (2).

   <<Probe Gain Test>>

7. Press the Keysight 4195A's **TRIG/RESET** key to make a single sweep measurement.

8. Press the **SCALE REF** key and the **'A AUTO SCALE'** softkey for auto scaling.

9. Move the o marker on the Keysight 4195A's display to the 50 MHz sweep point by rotating the rotary knob on the Keysight 4195A's front panel.

10. Confirm that the T/R data displayed in the upper right corner of the Keysight 4195A's display is 0 dB ± 0.5 dB.

    <<Frequency Response>>

11. Enter the Keysight 4195A “A=A-A(88)” command using the following key stroke sequence to have the Keysight 4195A display the frequency response test results.

    CLR LINE, blue shiftkey**, A, =, A, -, A, MATH OPERATOR,**

    '(', 8, 8, ')', ENTER/EXECUTE

12. Sequentially press the following keys to set the Keysight 4195A's analysis range.

    MORE, 'ANA RNG'

    (move the * marker to the 50 Hz point)

    'active oMKR *MKR' (**"oMKR"** in this softkey will change to intensified green)

    (move the o marker to the 10 Hz point)

    'STORE ANA RNG'

    'PART ANA on off' (**"on"** in this softkey will change to intensified green)

13. Press the **MKR→** key and the **'MKR→MAX'** softkey to move the o marker to the maximum point between 10 Hz and 50 Hz. And confirm that the T/R data displayed on the upper right corner of the Keysight 4195A's display is within +1 dB/–2 dB.

14. Press the **'MKR→MIN'** softkey to move the o marker to the minimum point between 10 Hz and 50 Hz. And confirm that the T/R data displayed in the upper right corner of the Keysight 4195A's display is within +1 dB/–2 dB.

15. Sequentially press the following keys to change the Keysight 4195A's analysis range.

    MORE, 'ANA RNG'

    (move the o marker to the 200 MHz point)

    'STORE ANA RNG'

16. Press the **MKR→** key and the **'MKR→MAX'** softkey to move the o marker to the maximum point between 50 Hz and 200 MHz, and confirm that the T/R data is within ±1 dB.

17. Press the **'MKR→MIN'** softkey to move the o marker to the minimum point between 50 Hz and 200 MHz, and confirm that the data T/R is within ±1 dB.

18. Sequentially press the following keys to change the Keysight 4195A's analysis range.

    MORE, 'ANA RNG'

    (move the o marker to the 200 MHz point)

    'active oMKR *MKR' (**"*MKR"** in this softkey will change to intensified green)

    (move the * marker to the 500 MHz point)

    'STORE ANA RNG'

19. Press the **MKR→** key and the **'MKR→MAX'** softkey to move the * marker to the maximum point between 200 MHz and 500 MHz, and confirm that the data T/R is within +1.5 dB/–2 dB.
20. Press the **'MKR→MIN'** softkey to move the * marker to the minimum point between 200 MHz and 500 MHz, and confirm that the T/R data is within +1.5 dB/–2 dB.

1 dB Gain Compression Tests

Description

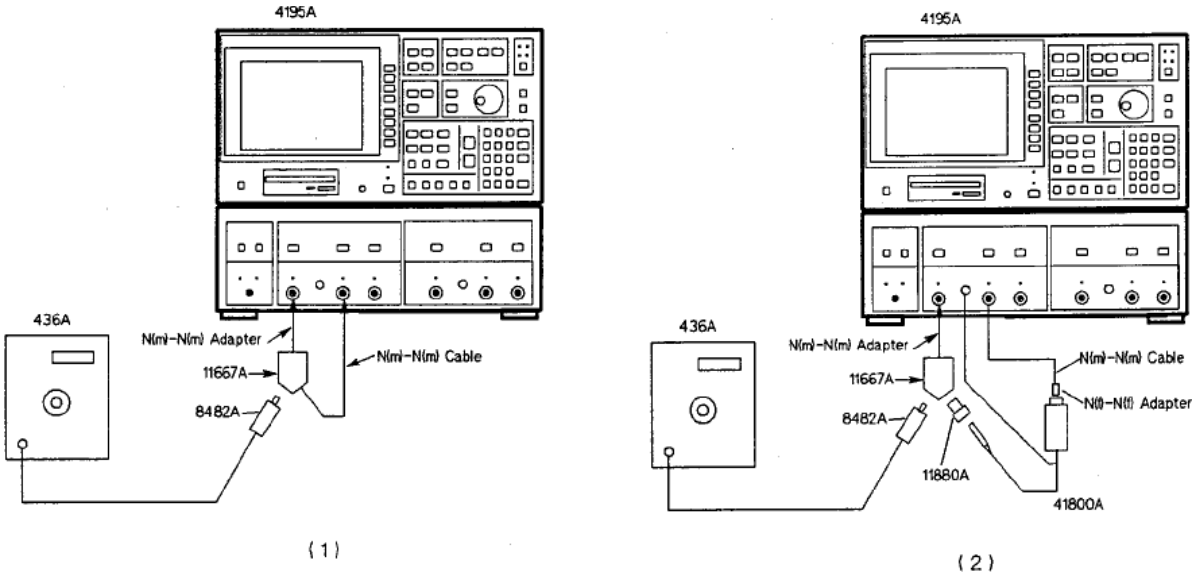
The 1 dB Gain Compression Test checks the gain compression of the probe amplifier.

Specifications (at 23 °C ± 5 °C)

> +3 dBm at 500 MHz

Setup

Figure 4-2 1 dB Gain Compression Test Setup



Equipment

Spectrum Analyzer	Keysight 4195A
Power Meter	Keysight 436A
Power Sensor	Keysight 8482A
Power Splitter	Keysight 11667A
Probe to N(m) Adapter	Keysight 11880A (11880-60001)
N(m)-N(m) Cable	Keysight 11500B
N(f)-N(f) Adapter	PN 1250-0777
N(m)-N(m) Adapter	PN 1250-0778

Procedure

1. Connect the power sensor to the power meter.
2. Calibrate the power meter for the power sensor.
3. Set the power meter to the dBm mode, and set the CAL FACTOR % knob to the value required by the power sensor at 500 MHz, and zero the meter.
4. Connect the power splitter to the Keysight 4195A, and connect the power sensor to the power splitter as shown in Figure 4-2 (1).
5. Sequentially press the following Keysight 4195A front panel keys to set the Keysight 4195A to the 1 dB Gain Compression test setting.

   CONFIG, 'SPECTRUM', PRESET

   MENU, 'PRMTR menu', 'OSC LVL [dBm]', 'SPOT FREQ', 5, 0, 0, MHz/V

   'return', 'TRIGGER menu', 'SINGLE mode'

   START, -, 1, 1, ENTER/EXECUTE

   STOP, 1, 5, ENTER/EXECUTE

   RES BW, 1, kHz/dBm

   REF ATTEN (CHANNEL 1 side)**, 4, 0, ENTER/EXECUTE**

   CONFIG, 'PORT SELECT', 'SOURCE CH1'
6. Press the Keysight 4195A's **TRIG/RESET** key to make a single sweep measurement.
7. Enter the Keysight 4195A “C=A” command using the following key sequence.

   CLR LINE, blue shiftkey**, C, =, A, ENTER/EXECUTE**

8. Disconnect N(m)-N(m) Cable from the power splitter, and connect the 41800A between the power splitter and N(m)-N(m) Cable, as shown in Figure 4-2 (2).
9. Press the Keysight 4195A's **TRIG/RESET** key to make a single sweep measurement.
10. Enter the Keysight 4195A “A=A-C” command using the following key sequence.

    CLR LINE, blue shiftkey**, A, =, A, -, C, ENTER/EXECUTE**
11. Enter the Keysight 4195A “A=A-A(1)” command using the following key sequence.

    CLR LINE, blue shiftkey**, A, =, A, -, A, MATH OPERATOR,**

    '(', 1, ')', ENTER/EXECUTE
12. Press the **SCALE REF** key and the **'A AUTO SCALE'** softkey for auto scaling.
13. Move the o marker to the point at which the **MAG** (data A) displayed in the upper right corner of the Keysight 4195A's display indicates approximately –1 dBm.
14. Sequentially press the Keysight 4195A's **MENU** key, and the **'TRIGGER menu'** and **'MANUAL mode'** softkeys.
15. Conform that the power meter reading is greater than 3 dBm.

Performance Test Record

Keysight

Model 41800A

Active Probe

Tested by _____

Date _____

Serial No. _____

Temperature _____

Humidity _____

PROBE GAIN (at 50 MHz):		
	Specification	**Actual**
	0 dB ±0.5 dB	_____ dB

FREQUENCY RESPONSE (relative to 50 MHz):		
	Specification	**Actual**
Max. at 10 Hz ≤ f <50 Hz:	+1 dB/–2 dB	_____ dB
Min. at 10 Hz ≤ f <50 Hz:	+1 dB/–2 dB	_____ dB
Max. at 50 Hz ≤ f ≤200 MHz:	±1 dB	_____ dB
Min. at 10 Hz ≤ f ≤200 MHz:	±1 dB	_____ dB
Max. at f > 200 MHz:	+1.5 dB/–2 dB	_____ dB
Min. at f > 200 MHz:	+1.5 dB/–2 dB	_____ dB

1 dB GAIN COMPRESSION:		
	Specification	**Actual**
	> 3 dBm	_____ dB

5 Adjustment

Introduction

This section describes the adjustments required to return the 41800A to the specifications listed in "Specifications" on page 10. If the 41800A failed the performance test, or after it has been repaired. If proper performance cannot be achieved after these adjustments, refer to Chapter 6 , "Service", on page 53.

Equipment Required

Table 4-1 lists the equipment required for adjustment.

Preparation

This paragraph provides the information which you should know, and the procedures that you must perform before starting the adjustments.

1. The test equipment must be allowed to warm-up and stabilize for at least 30 minutes.
2. A Keysight 4195A is required to test the 41800A. In the remainder of this manual, softkeys are indicated in boldface type and enclosed in single quotes (e.g., **'NETWORK'** softkey), and keys are indicated in boldface type only (e.g. **PRESET** key).

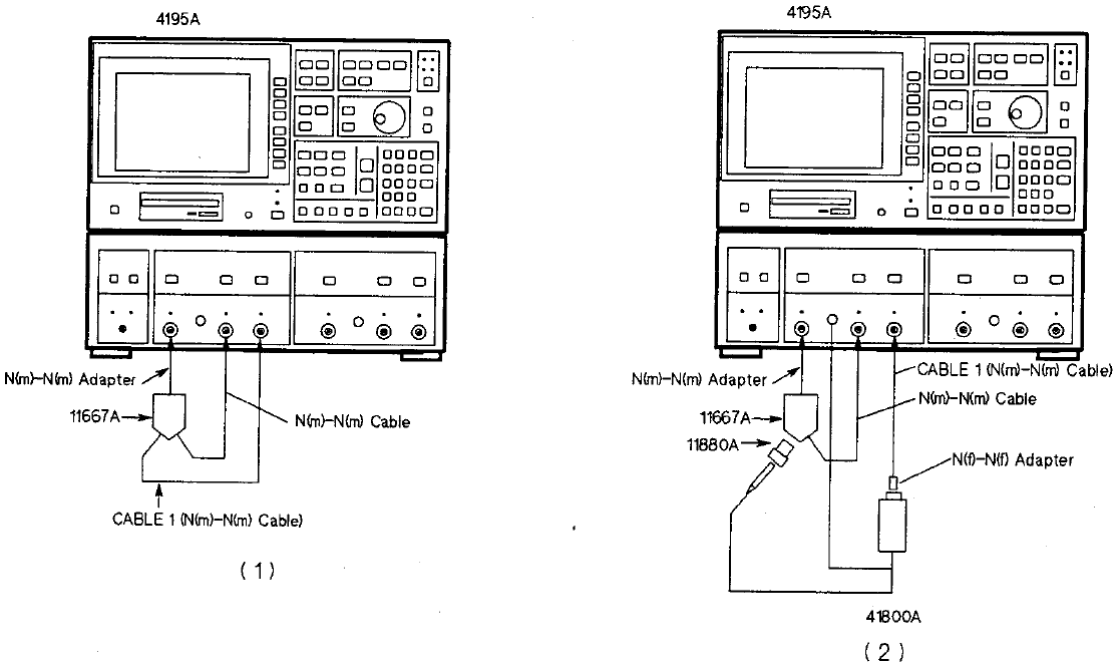
LF Gain/Flatness Adjustment

Description

The LF Gain/Flatness Adjustment adjusts the 41800A gain and frequency response.

Setup

Figure 5-1 LF Gain/Flatness Adjustment Setup



Equipment

Network Analyzer	Keysight 4195A
Power Splitter	Keysight 11667A
Probe to N(m) Adapter	Keysight 11880A (11880-60001)
N(m)-N(m) Cable	Keysight 11500B
N(f)-N(f) Adapter	PN 1250-0777
N(m)-N(m) Adapter	PN 1250-0778

Procedure

1. Connect the power splitter to the Keysight 4195A as shown in Figure 5-1 (1).
2. Sequentially press the following Keysight 4195A front panel keys, to set the Keysight 4195A to the adjustment settings.

   CONFIG, 'NETWORK', PRESET

   AMPLITUDE (CHANNEL 1 side)**, -, 1, 4, ENTER/EXECUTE**

   REF ATTEN (CHANNEL 1 side)**, 0, ENTER/EXECUTE**

   TEST ATTEN (CHANNEL 1 side)**, 0, ENTER/EXECUTE**

   START, 1, 0, Hz/dBµV

   STOP, 5, 0, MHz/V

   MENU, 'TRIGGER menu', 'SINGLE mode', 'return'

   'RESOLUTN menu', 'No. of POINTS', 2, 1, ENTER/EXECUTE

'return', 'TYPE lin log'	(**"log"** in the **'TYPE lin log'** softkey will change to intensified green.)
DISPLAY, 'TRACE B on off'	(**"off"** in the **'TRACE B on off'** softkey will change to intensified green.)
AUTO	(The yellow LED in the **AUTO** key will turn on.)

3. Sequentially press the following keys to perform a normalize (thorough) calibration, and wait until the message "Cal completed" is displayed.

   CAL, 'TRANS CAL menu', 'NORMLIZE (THRU)', 'THRU', ENTER/EXECUTE

4. Press the Keysight 4195A's **CAL** key and the **'CORRECTN on off'** softkey to activate the Keysight 4195A's correction capability. The "**on**" in this softkey will change to intensified green.
5. Disconnect CABLE 1 (see Figure 5-1 (1)) from the power splitter, and connect the 41800A between the power splitter and CABLE 1 as shown in Figure 5-1 (2).
6. Press the Keysight 4195A's **TRIG/RESET** key to make a single sweep measurement.
7. Enter the "REF=A(21)+0.5" command and "DIV=0.1" command to set the scale of the Keysight 4195A's display, using the following key sequence.

   SCALE REF, 'A REF LEVEL', blue shiftkey**, A, MATH OPERATOR,**

   '(', 2, 1, ')', ' + ', 0, ., 5, ENTER/EXECUTE

   SCALE REF, 'A /DIV', 0, ., 1, ENTER/EXECUTE

8. Press the **TRIG/RESET** key, and the **'CONT mode'** softkey to select the continuous sweep mode.
9. Adjust R18 (LF GAIN) and R25 (FLATNESS) so that the T/R data displayed by the Keysight 4195A is within ±0.5 dB for the data at 50 MHz, as shown in Figure 5-3.

Figure 5-2 Adjustment Component Locations

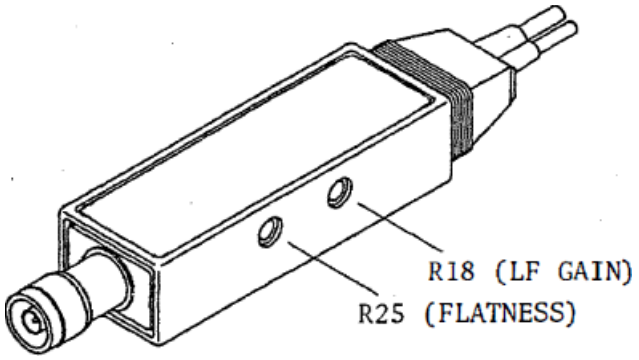
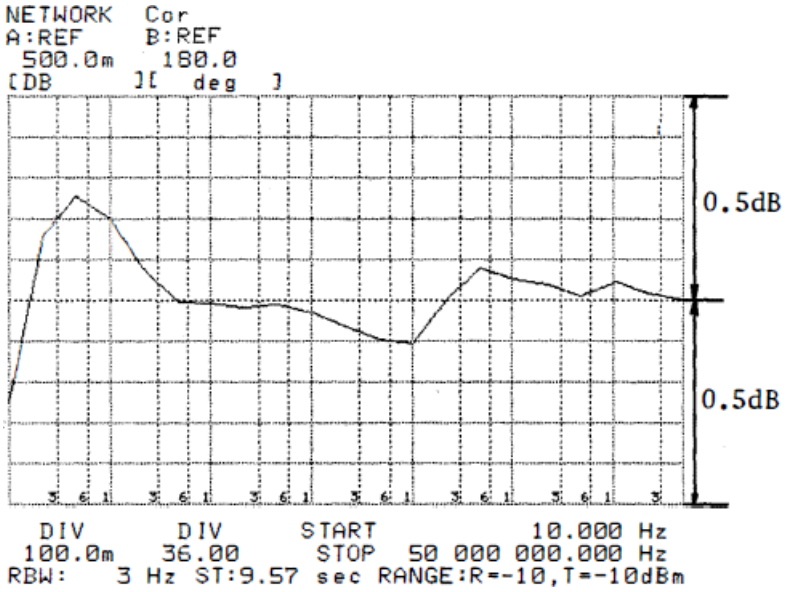


Figure 5-3 Adjustment Example



6 Service

Introduction

This section contains the replaceable parts information, disassembly procedures, and troubleshooting and repair information.

Replaceable Parts

The 41800A's replaceable parts are fisted in Table 6-1 to Table 6-3. Table 6-1 to Table 6-3 gives the Keysight part number, quantity (Qty.), and description.

To order a part listed in Table 6-1 to Table 6-3, indicate the Keysight part number and the quantity desired. Address your order to the nearest Keysight Technologies office.

Figure 6-1 Replaceable Parts (1 of 3)

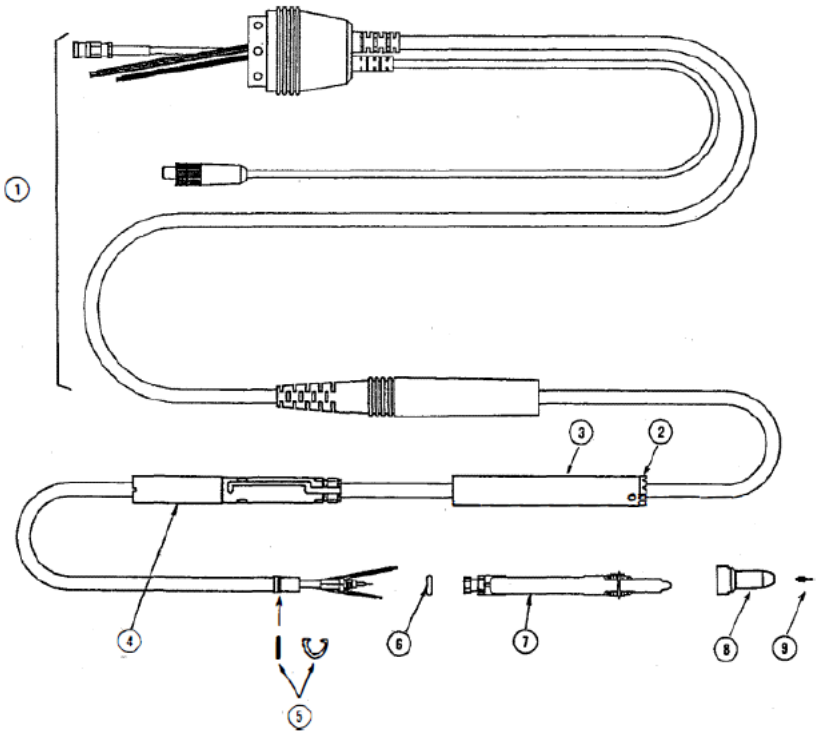


Table 6-1 Replaceable Parts (1 of 3)

Reference Designator	Part Number	RoHS Compliant Replacement Part Number	Qty.	Description
1	41800-61601	41800-61671	1	Cable Assembly
2	41800-40005	41800-40005	1	Support Shield
3	41800-24012	41800-24012	1	Protective Sleeve
4	41800-24010	41800-24010	1	Outer Tube Probe
5	0510-1325	0510-1325	1	Retainer CE Ring
6	0905-1150	0905-1150	1	0 Ring
7	41800-60005	41800-61071[1]	1	PC Board/Heatsink Assembly
8	41800-60002	41800-60008	1	Nose Assembly
9	41800-60003	41800-60003	1	12 mil Probe Pin Assembly
	41800-60004	41800-60004	1	30 mil Probe Pin Assembly

1. RoHS compliant replacement part description: Probe Assembly

Figure 6-2 Replaceable parts (2 of 3)

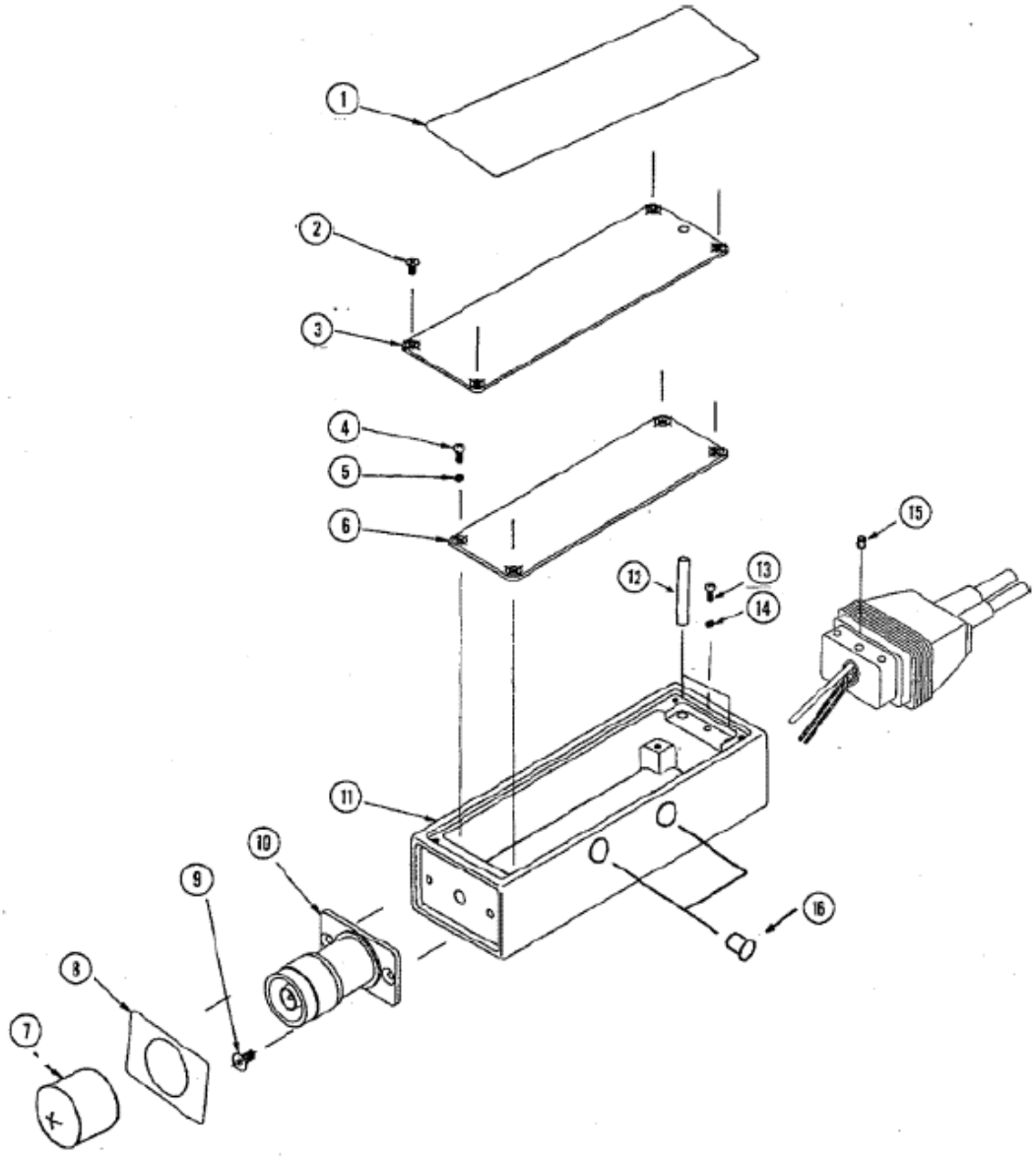


Table 6-2 Replaceable Parts (2 of 3)

Reference Designator	Part Number	RoHS Compliant Replacement Part Number	Qty.	Description
1	41800-87111	41800-87111	1	Label
2	0515-1873	0515-1602	4	Screw Metric
3	41800-04001	41800-04001	1	Cover

Table 6-2 Replaceable Parts (2 of 3) (Continued)

Reference Designator	Part Number	RoHS Compliant Replacement Part Number	Qty.	Description
4	0515-0976	0515-0677	5	Screw M2 L6
5	2190-0654	2190-0654	5	Washer
6	41800-66502	41800-61071[1]	1	Amplifier/Regulator Board Assembly
7	1401-0214	1401-0214	1	PVC Cap
8	41800-87112	41800-87172	1	Label
9	0515-0914	0515-1946	2	Screw-Mach M3×0.5
10	1250-2229	250-3830[2]	1	Connector N-PR-237
11	41800-20001	41800-20071	1	Case
12	41800-23003	41800-23003	2	Shaft
13	0515-0976	0515-0677		Screw M2 L6
14	2190-0654	2190-0654		Washer
15	41800-24004	41800-24004	1	Spacer
16	6960-0147	6960-0076	2	Plug Hole

1. RoHS compliant replacement part description: Probe Assembly
2. RoHS compliant replacement part description: Connector RF Plug 50 Ohm

Figure 6-3 Replaceable Parts (3 of 3)

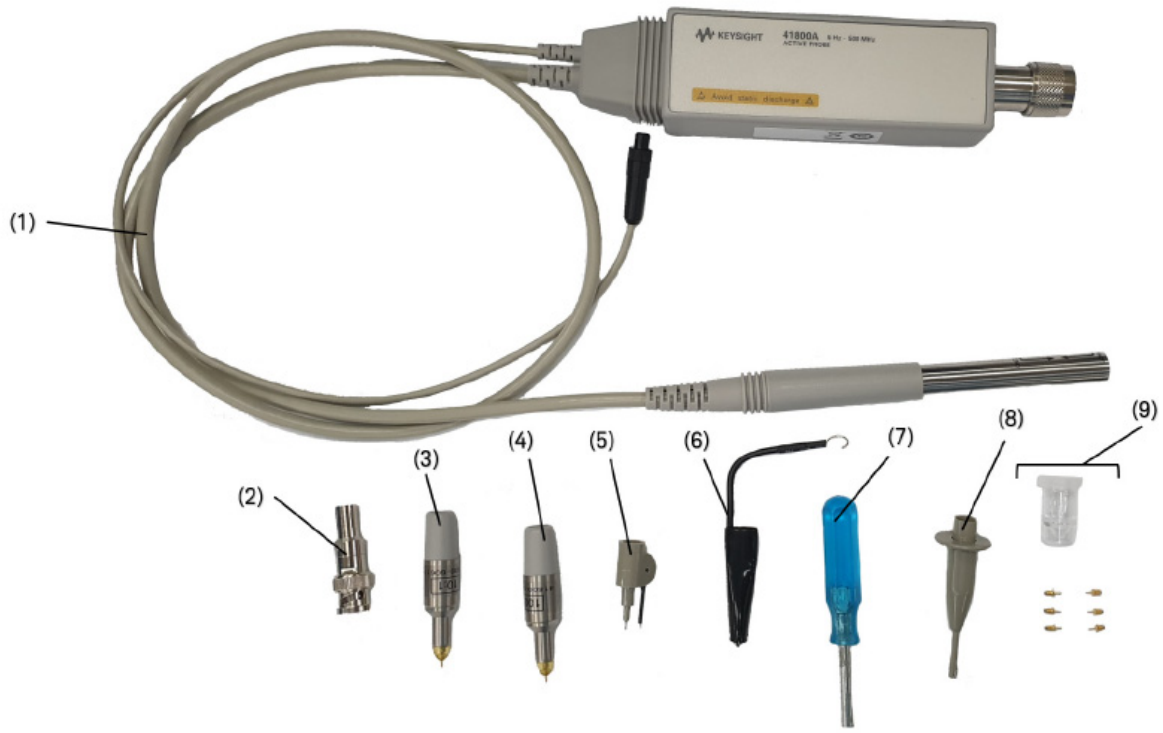


Table 6-3 Replaceable Parts (3 of 3)

Reference Designator	Part Number	RoHS Compliant Replacement Part Number	Qty.	Description
1	41800-61001[1]	41800-61071[1]	1	Probe Assembly
2	41800-60013	41800-60013	1	Probe-BNC(m) Adapter
3	41800-60011	41800-60611	1	10:1 Divider Assembly
4	41800-60012	41800-60612	1	100:1 Divider Assembly
5	5060-0549	5060-0549	1	Slip-on Spanner Ground Tip
6	41800-61602	41800-61672	1	Ground Clip (flexible)
7	8710-1806WN	8710-1806WN	1	Probe Tip Nut Driver (3/32 inch)
8	10229A	10229-60001	1	Hook Tip Adapter

Table 6-3 Replaceable Parts (3 of 3) (Continued)

Reference Designator	Part Number	RoHS Compliant Replacement Part Number	Qty.	Description
9	41800-60021	41800-60021	1	Spare Probe Pin Set (12 mil pin×3, 30 mil pin×3)

1. Keysight internal-only part number.

Disassembly

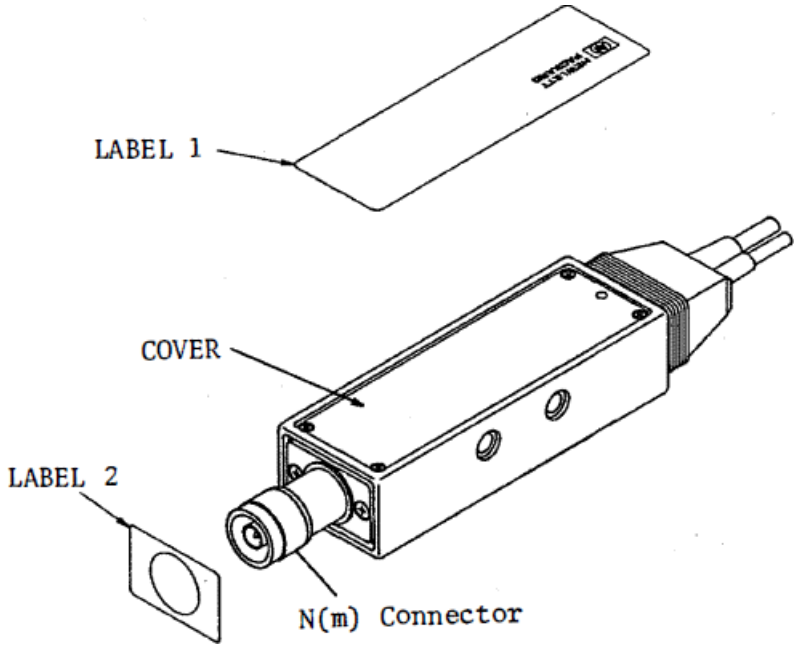
This paragraph describes the procedures for removing the Amplifier/Regulator Board Assembly (PN 41800-61071), and the PC Board/Heatsink Assembly (PN 41800-61071).

Removing the Amplifier/Regulator Board Assembly requires removing the labels on the 41800A. The labels will be damaged when you remove them. Use new labels after reassembling the 41800A (you must order the labels).

Amplifier/Regulator Board Assembly Removal

1. Remove LABEL 1 from the COVER, and remove LABEL 2 from the N(m) Connector.

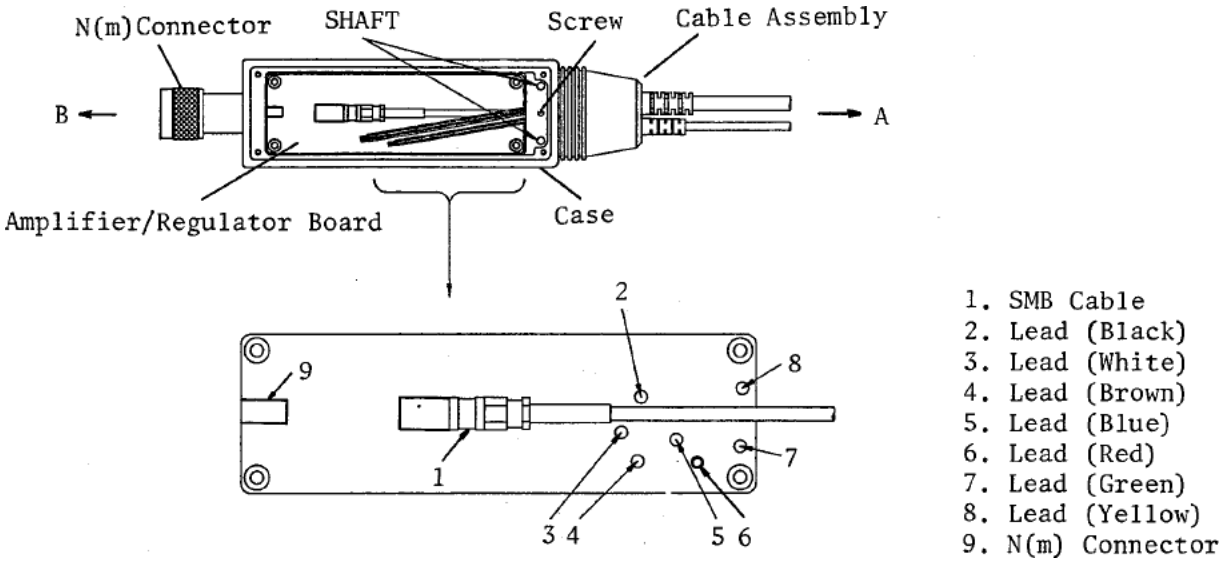
Figure 6-4 Label/Cover Removal



2. Remove the four screws holding the COVER and remove the COVER.

3. Remove the two screws holding the N(m) connector.
4. Remove the two SHAFTs and the screw as shown in Figure 6-5.

Figure 6-5 Amplifier/Regulator Board Disassembly

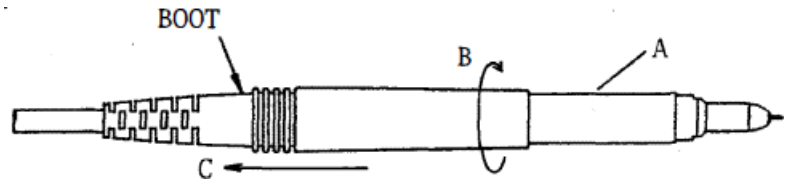


5. Disconnect the coaxial cable (item 1 in Figure 6-5) from the SMB connector on the Amplifier/Regulator Board assembly.
6. Remove the leads, item 2 through 8 on Figure 6-5, from the Amplifier/Regulator Board assembly.
7. Draw the coaxial cable and leads, a part of cable assembly PN 41800-61671, from the CASE toward the arrow A as shown in Figure 6-5.
8. Remove the solder at point 9 as shown in Figure 6-5.
9. Remove the N(m) connector from the CASE toward the arrow B shown Figure 6-5, while holding the soldering iron at point 9 as shown in Figure 6-5.
10. Remove the four screws holding the Amplifier/Regulator Board assembly in place.
11. Remove the Amplifier/Regulator Board assembly from the CASE.

PC Board/Heatsink Assembly Disassembly

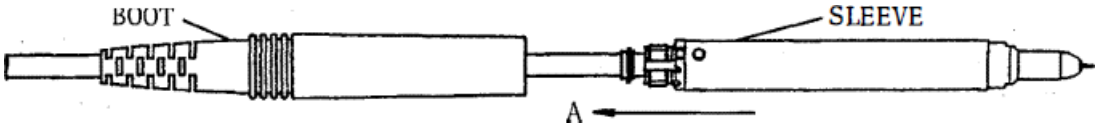
1. Remove the cable strain relief BOOT using the following procedure.
   a. Hold the probe by hand at position A as shown in Figure 6-6.
   b. Remove the BOOT by rotating it in the direction of arrow B as shown in Figure 6-6.
   c. Slide the BOOT in the direction of arrow C as shown in Figure 6-6.

Figure 6-6 Boot Removal



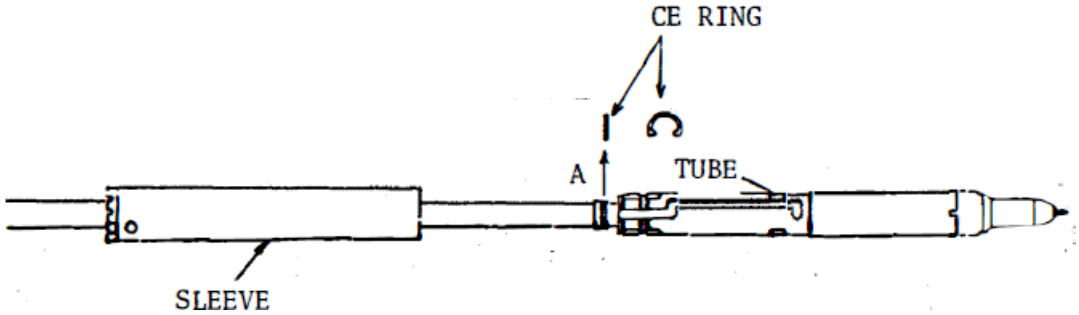
2. Slide the SLEEVE in the direction of arrow A as shown in Figure 6-7.

Figure 6-7 Sleeve Removal



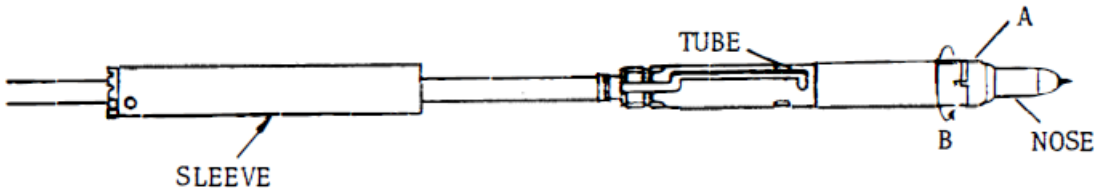
3. Pull out the CE RING in the direction of arrow A as shown in Figure 6-8.

Figure 6-8 CE Ring Removal



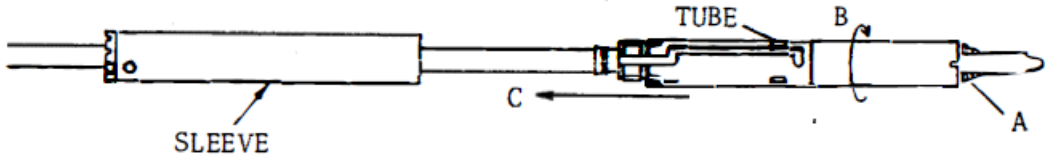
4. Remove the probe NOSE piece using the following procedure.
   a. Use a wrench to hold the NOSE piece at position A as shown in Figure 6-9.
   b. Remove the NOSE piece by rotating it in the direction of arrow B as shown in Figure 6-9.
   c. Remove the NOSE piece.

Figure 6-9 NOSE Removal



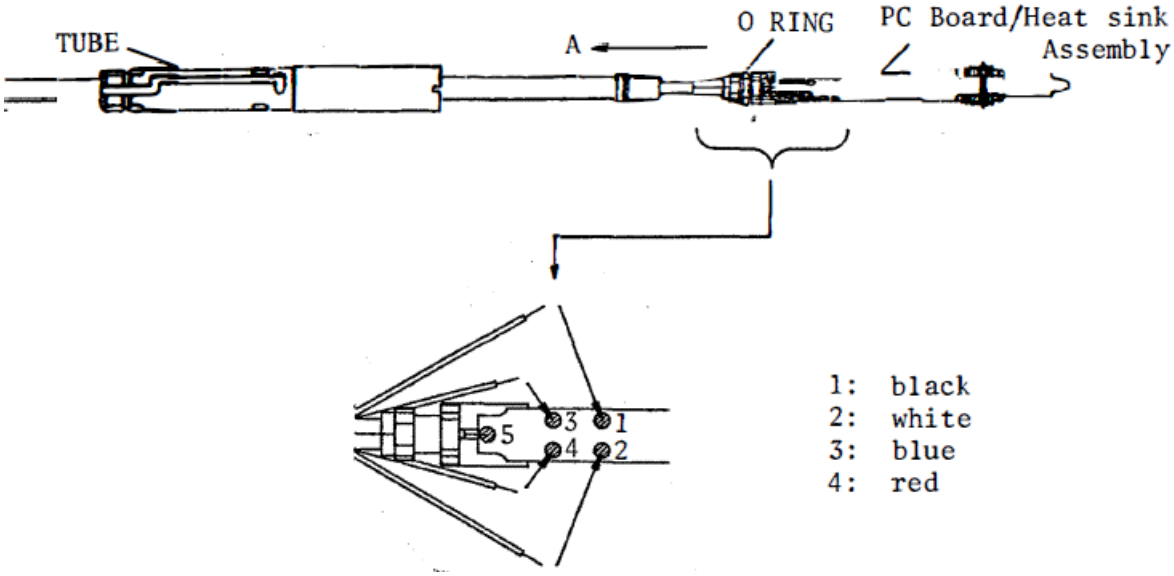
5. Remove the TUBE using the following procedure.
   a. Hold the probe with a wrench at position A as shown in Figure 6-10.
   b. Remove the TU BE by rotating it in the direction of arrow B as shown in Figure 6-10.
   c. Slide the TUBE in the direction of arrow C as shown in Figure 6-10.

Figure 6-10 Tube Removal



6. Slide the O RING in direction A as shown in Figure 6-11.

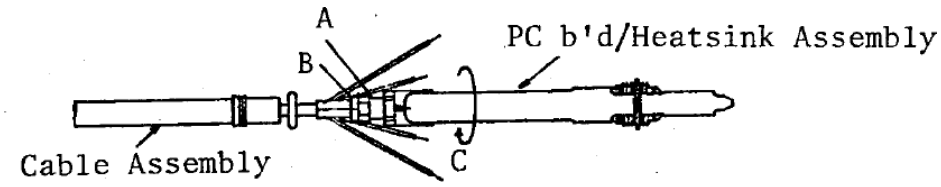
Figure 6-11 O Ring and Lead Removal



7. Remove leads No. 1 through 5 as shown in Figure 6-11, from the PC Board/Heatsink assembly.

8. Remove the PC Board/Heatsink Assembly using the following procedure.
   a. Hold the probe at positions A and B as shown in Figure 6-12 using pliers or a wrench.
   b. Remove the PC Board/Heatsink assembly by rotating it in the direction of arrow C as shown in Figure 6-12.

Figure 6-12 PC Board/Heatsink Assembly Removal



Theory of Operation

The 41800A active probe consists of amplifiers and regulators. The amplifiers provide unity gain. The amplifiers are on the PC board/Heatsink assembly and the Amplifier/Regulator Board assembly.

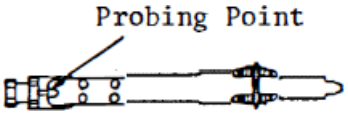
The regulators convert the DC voltage (+15 V and –12.6 V) supplied from the host instrument, and supply the regulated DC voltages (+15 V, +9 V, –7 V, and –12 V) to the amplifiers. The regulators are on the Amplifier/Regulator Board assembly.

Troubleshooting Guide

Troubleshooting should be begin during the performance test. If the 41800A fails the performance test, perform the following procedure.

1. Check the voltage supplied by the host instrument. Refer to Figure 2-2, “Probe Power Requirements” on page 15 for the required voltage.
2. Check the probe tip for damage. If the probe tip is defective, replace the probe tip.
3. Confirm that the gain of the PC board/Heatsink assembly is approximately –6 dB. The probing point is shown in Figure 6-13. If the gain is wrong, replace the PC board/Heatsink assembly.

Figure 6-13 PC Board/Heatsink Assembly Check

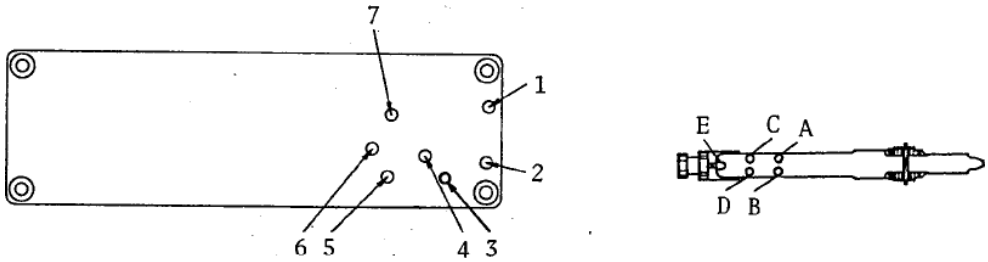


4. Check the Cable assembly for damage. If it is defective, replace it.

   Lead assignment:

   1 –12.6 V (from Host Instrument)
   2 +15 V (from Host Instrument)
   3 +9 V (to PC Board/Heatsink Assembly)
   4 –7 V (to PC Board/Heatsink Assembly)
   5 GND (from Host Instrument)
   6 S (from PC Board/Heatsink Assembly)
   7 R (from PC Board/Heatsink Assembly)
   A R (to Amplifier/Regulator Board)
   B S (to Amplifier/Regulator Board)
   C –7 V (from Amplifier/Regulator Board)
   D +9 V (from Amplifier/Regulator Board)
   E (coaxial cable)

Figure 6-14 Lead Assignment



5. If the PC board/Heatsink assembly and the Cable assembly is okay, the Amplifier/Regulator board is defective.

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