Keysight 85024A High Frequency Probe

User's and Service Guide

KEYSIGHT TECHNOLOGIES

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Assistance

Product maintenance agreements and other customer assistance agreements are available for Keysight products.

For any assistance, contact the nearest Keysight sales or service office. Refer to "Sales and Technical Support" on page 6 for a list of Keysight offices.

How to Use This Guide

This guide uses the following conventions:

[Front Panel Key]	This represents a key physically located on the instrument.
SOFTKEY	This represents a "softkey", a key whose label is determined by the instrument firmware.

Environmental Conditions

The 85024A is designed for indoor use and in an area with low condensation. The table below shows the general environmental requirements for this instrument.

Environmental condition	Requirement
Temperature	Operating condition – 0 °C to 55 °C Storage condition – –40 °C to 70 °C
Humidity	Protect this product from temperature extremes which can cause internal condensation.
Altitude	Operating condition – Up to 4,600 meters (15,000 feet) Storage condition – Up to 15,000 meters (50,000 feet)

Regulatory Markings

	This symbol indicates the time period during which no hazardous or toxic substance elements are expected to leak or deteriorate during normal use. Forty years is the expected useful life of the product.
	This instrument complies with the WEEE Directive (2002/96/EC) marking requirement. This affixed product label indicates that you must not discard this electrical or electronic product in domestic household waste.
	**South Korean Class A EMC Declaration** A 급 기기 (업무용 방송통신기자재) 이 기기는 업무용 (A 급) 전자파적합기기로서 판 매자 또는 사용자는 이 점을 주 의하시기 바라 며 , 가정외의 지역에서 사용하는 것을 목적으 로 합니다 . This symbol is a South Korean Class A EMC Declaration. This is a Class A instrument suitable for professional use and in electromagnetic environment outside of the home.

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This instrument complies with the WEEE Directive marking requirement. This affixed product label indicates that you must not discard this electrical or electronic product in domestic household waste.

Product category:

With reference to the equipment types in the WEEE directive Annex 1, this instrument is classified as a “Monitoring and Control Instrument” product.

The affixed product label is as shown below.

Do not dispose in domestic household waste.

To return this unwanted instrument, contact your nearest Keysight Service Center, or visit http://about.keysight.com/en/companyinfo/environment/takeback.shtml for more information.

Sales and Technical Support

To contact Keysight for sales and technical support, refer to the support links on the following Keysight websites:

- www.keysight.com/find/rfprobes
  (product-specific information and support, software and documentation updates)
- www.keysight.com/find/assist
  (worldwide contact information for repair and service)

Table of Contents

List of Figures

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List of Tables

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1 General Information

Read This Before Using Your Probe

Your probe has been designed to provide years of uninterrupted service. Excellent performance at high frequencies requires the use of very small and delicate devices. Such components can be damaged by careless use.

Maximum rated input voltage

It is vital that the following specifications are not exceeded:

- Maximum DC input voltage (without 10:1 divider): ±50 V
- Maximum DC input voltage through a 10:1 divider: ±50 V
- Maximum RF voltage (without 10:1 divider): 1.5 V peak
- Maximum RF voltage through a 10:1 divider: 15 V peak

To minimize the potential for damage, always begin measurements with the 10:1 divider attached.

Remove the 10:1 divider only when both of the following conditions are met:

- RF and DC levels are known to be less than or equal to the rated input voltage.
- Higher sensitivity is required than is possible with the 10:1 divider attached.

When the probe is stored, attach the 10:1 divider and place the anti-static protection cap over the probe tip.

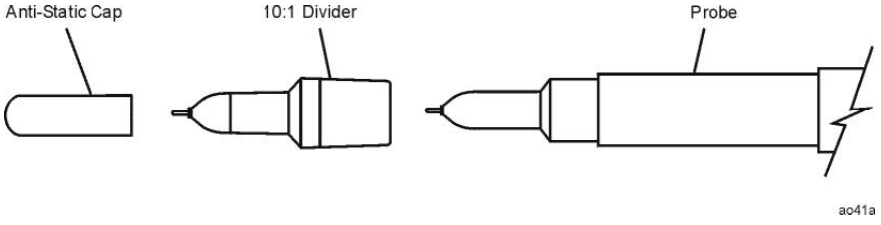

Figure 1-1 Probe with 10:1 divider and anti-static protection cap

Anti-Static Precautions

Electrostatic discharge (ESD) is a serious problem; take consistent steps to eliminate it. This is important whenever using your probe.

- *Never touch the tip of the probe.* The probe microcircuit is susceptible to damage by static discharge.
- *Eliminate ESD on the body.* Wear a ground strap when using the probe.
- *Eliminate ESD on the work surface.* Use an anti-static bench mat. Never use the probe near a workbench that is covered by carpet.

Do not introduce ESD into the device under test (DUT) while the probe is in use. If an unprotected person touches part of the DUT, a static charge could damage the DUT as well as the probe.

Product Description

Your high frequency probe is an active probe that provides low input capacitance, high input impedance, and wide bandwidth. The probe may be used with a variety of network analyzers, spectrum analyzers, frequency counters, and oscilloscopes.

The probe allows the testing of high frequency RF circuits. High input impedance is maintained by a Gallium Arsenide (GaAs) field effect transistor (FET) microcircuit.

When not in use, the probe tip is protected by a retractable grounded metal sleeve. This helps prevent electrostatic discharge damage to the probe, and protects the tip from breaking if the probe is dropped.

The probe tip may be inserted into the supplied probe adapter, adjusting the probe tip to a 50 **Ω** type-N male connector. The probe's output connector is a type-N male.

Specifications and Characteristics

For the specifications and characteristics of the 85024A High Frequency Probe, refer to the data sheet at http://literature.cdn.keysight.com/litweb/pdf/5968-2101E.pdf

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2 Accessories

Probe Features and Accessories

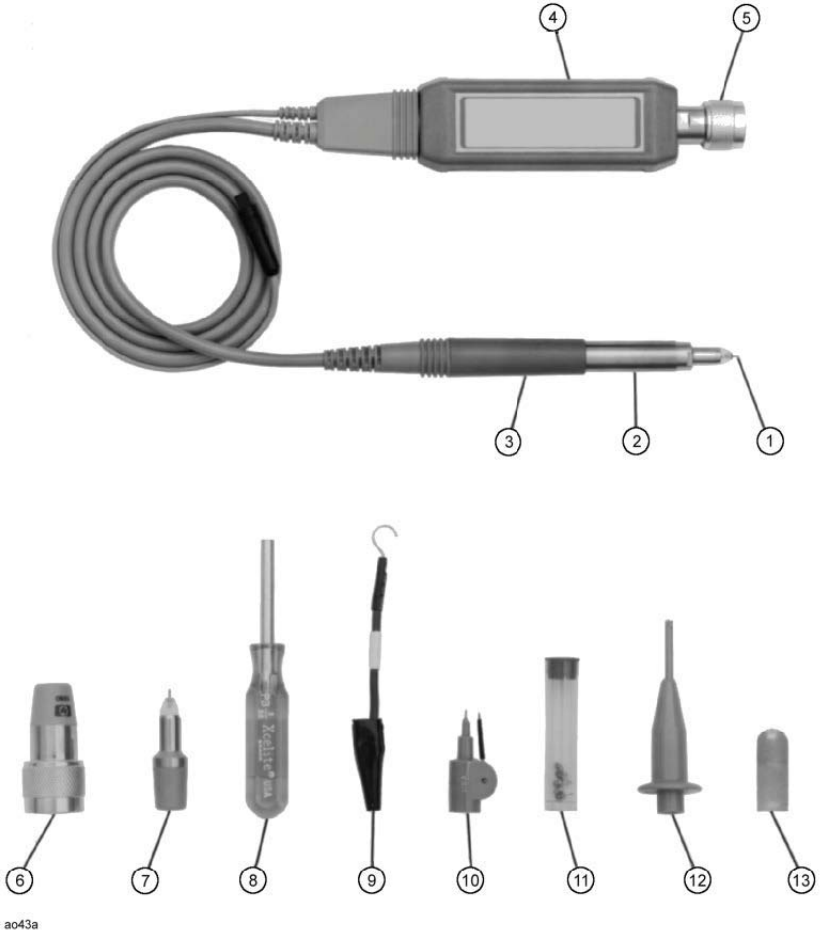


Figure 2-1 Probe features

Table 2-1 Probe features

Item	Description	Keysight part number
1	Probe tip	85024-60015
2, 3	Cable/Probe wand kit (pre-assembled)	85024-60014
4	Regulator assembly (internal PC board)	85024-63071
5	RF output connector (type-N male)	85024-60013
6	Probe tip to type-N adapter	11880-60001
7	10:1 divider	11881-60001
8	Probe tip nut driver	8710-1806
9	Ground lead, flexible	41800-61672
10	Slip-on tip with grounding spike	5060-0549
11	Replacement tip (short) Replacement tip (long)	85024-60015 85024-60016
12	Hook tip adapter	10229A
13	Anti-static protection cap	08405-40003

Table 2-2 Available accessories

Description	Keysight part or model number
Type-N connector gage kit	85054B
Adapter, type-N female to precision 7 mm[a]	11524A
Adapter, type-N female to BNC male[b]	1250-1477
External DC power supply adapter cable[c]	85024A-001

[a] Used with the 85046A s-parameter test set.

[b] Used with the 8590A spectrum analyzer.

[c] Requires the E3620A, E3630A, or E3631A External Power Supply from Keysight Technologies.

Probe Adapter

Description

The probe adapter fits over the tip of the probe and converts the probe input to a 50 Ω type-N male connector. The adapter is only used when performance testing the probe.

Operating characteristics

Nominal input impedance	50 Ω
Frequency range	Same as the active probe (300 kHz to 3 GHz)

Inspection

Periodically inspect the threads of the adapter for signs of wear and damage. Inspect the barrel of the probe receptacle, making sure it is clean and free of grit. Clean the adapter threads or receptacle with clean compressed air.

10:1 Divider

The 10:1 divider fits over the tip of the probe and provides the following changes to the probe's operating parameters:

- Increases (by a factor of 10) the input voltage at which 1 dB compression occurs.
- Decreases the input capacitance without changing input resistance, thereby decreasing capacitive loading.

Two or more dividers may be cascaded to provide higher divide ratios.

Operating characteristics

Divider ratio	10:1
Input capacitance	Typically <0.7 pF
Input resistance	1 MΩ
Input voltage for 1 dB compression	3.0 volts peak[a]
Maximum rated DC input voltage	±50 volts
Maximum rated RF input voltage	15 volts peak
Frequency range	Same as the active probe (300 kHz to 3 GHz)

[a] When used with the active probe.

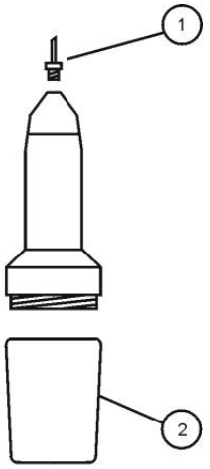
Inspection

Make sure the tip is not bent or discolored. Periodically inspect the barrel of the probe receptacle, making sure it is clean and free of grit. Clean the receptacle with clean compressed air.

When cascading 10:1 dividers, periodically inspect and clean the exterior of the metal sleeve.

Replaceable parts

If the tip is discolored, bent or broken, it must be replaced. Follow the procedure outlined in Replacing the probe tip below.



ao44a

Item	Description	Part number
1	Short probe tip Long probe tip	85024-60015 85024-60016
2	Guide	11881-20007

Figure 2-2 Exploded view of 10:1 divider

Replacing the probe tip

1. Remove the 10:1 divider from the probe.
2. Unscrew the damaged tip with a 3/32 nut driver supplied with the probe and discard the tip.
3. Screw on the new tip and lightly tighten it with a 3/32 inch nut driver. (Over-tightening the tip can damage the nose assembly.)

3 Installation

Initial Inspection

If the shipping container or cushioning material is damaged, keep it until the contents of the shipment are checked for completeness, and the product is checked both mechanically and electrically. Procedures for checking the electrical performance are given in Chapter 5, "Performance Tests".

Notify the nearest Keysight Technologies office if the product does not pass performance tests, the shipping contents are incomplete, or if there is mechanical damage or defect. Notify the carrier if the shipping container is damaged or if the cushioning material shows signs of stress. Keep all shipping materials for the carrier's inspection. Keysight Technologies will arrange for repair or replacement without waiting for a claim settlement.

Certification

Keysight Technologies certifies that this product met its published specifications at the time of shipment from the factory. Keysight further certifies that its calibration measurements are traceable to the United States National Institute of Standards and Technology (NIST, formerly NBC), to the extent allowed by the institute's calibration facility, and to the calibration facilities of other International Standards Organization members.

Preparation for Use

CAUTION

Electrostatic discharge (ESD), excessive input signals, or mechanical shock can dramatically degrade the performance of the probe. Be sure to observe the following precautions.

- *Never touch the tip of the probe!*
- Always hold the probe by the retracted metal sleeve.
- Work at a workstation equipped with an anti-static mat.
- Extend the protective sleeve when not actually taking measurements.
- Wear an anti-static wrist strap and avoid introducing static electricity into the device under test (DUT) or test setup.
- Make sure the device under test (DUT) is at the same ground potential as the probe.

Power requirements

If using the probe with an instrument that does not supply probe power, you can purchase an 85024A-001 adapter cable assembly and one of the following Keysight external power supplies:

- E3620A
- E3630A
- E3631A

You need to ensure the correct setting of the power supply (+15 V and –12.6 V) per attached labels on the 85024A-001 adapter cable assembly.

Mating Connectors

CAUTION **Periodically inspect and, if necessary, clean the type-N output connector. Refer to "Connector Inspection and Cleaning" on page 49. The probe adapter should be inspected at the same time, and cleaned if necessary.**

Returning the Product for Service

Contact Keysight Technologies before returning the probe for service. See "Sales and Technical Support" on page 6. When shipping the probe to Keysight Technologies please include a blue service tag (found at the end of this manual) and a valid return mailing address. Products cannot be returned to a post office box. Provide the name and phone number of a contact person within your organization, the complete model and serial number of the product, and a complete description of the problem.

When shipping the probe for any reason, be sure to use the original (or comparable) packaging materials.

Also mark the container FRAGILE to assure careful handling of the device.

When making inquiries, either by correspondence or by telephone, please refer to the probe by model and full serial number. Refer to "Sales and Technical Support" on page 6 for a list of Keysight Technologies sales and service offices.

4 Operation

Operating Precautions

CAUTION

Electrostatic discharge (ESD), excessive input signals or mechanical shock can dramatically degrade the performance of the probe. Be sure to observe the following precautions.

- *Never touch the tip of the probe!*
- Always hold the probe by the retracted metal sleeve.
- Work at a workstation equipped with an anti-static mat.
- Extend the protective sleeve when not actually taking measurements.
- Wear an anti-static wrist strap and avoid introducing static electricity into the device under test (DUT) or test setup.
- Make sure the device under test (DUT) is at the same ground potential as the probe.

Operating Instructions

CAUTION

Discharging the Probe Between Measurements

Measuring a node having a DC voltage potential charges blocking capacitors inside of the probe. Ground the probe tip after measuring such nodes to discharge the probe capacitors.

Failure to do this can result in damage to sensitive circuits in the DUT, especially if it is an active device.

Grounding the probe

Proper grounding is important when making measurements with any probe. The probe is supplied with two grounding devices: an alligator-type ground clip and a slip-on type ground tip. Use the shortest ground path possible. Proper grounding becomes more important as frequency increases. For optimum measurements in a factory environment, design your circuits with ground-plane feedthroughs next to every test point.

Retracting and extending the protective sleeve

Hold the probe wand in one hand, pointing the tip away from yourself. Grasp the probe sleeve in the other hand and turn about 1/4 turn counter-clockwise. Now, pull the sleeve toward you while slowly turning it counter-clockwise. The sleeve will now retract quickly with little counter-clockwise rotation. Reverse this procedure to extend the sleeve.

Operator's Check

The operator's check is designed to be a simple functional test for the probe. If the probe fails the operator's check, or if you need to verify that the probe meets its warranted specifications, you will need to do the performance tests as described in Chapter 5, "Performance Tests".

The operator's check can be performed with either a network analyzer or a spectrum analyzer. Use one of the following two procedures to perform the operator's check.

Operator's check using a network analyzer

Required equipment

Item	Part number
Network analyzer	Any compatible with type-N connectors
Type-N cable	50 Ω, male connectors
Probe adapter	11880-60001

Procedure

NOTE

If you are not familiar with network analyzer operation, refer to "Network Analyzer Operation" on page 37 for basic information about performing the analyzer operations used in this procedure.

1. Preset the analyzer using the **[PRESET]** hardkey.
2. Configure the analyzer to measure transmission.
3. Set the output power level of the analyzer to 0 dBm.
4. Set the frequency sweep range on the analyzer from 300 kHz to 3 GHz.
5. Connect a type-N cable (a through cable) between the output and the input ports on the analyzer.
6. Perform a response calibration on the analyzer. The trace on the analyzer should now be flat at 0 dB.

7 Remove the through cable. Connect the probe adapter to the output port of the analyzer. Connect the output of the probe to the input port of the analyzer. Connect the probe power cable to a power source.

8 Plug the probe tip into the adapter.

9 The trace of the analyzer should be within ±5 dB of 0 dB.

Operator's check using a spectrum analyzer

Required equipment

Item	Part number
Spectrum analyzer	Any compatible
Adapters	As necessary
Probe adapters	11880-60001

Procedure

1 Connect the spectrum analyzer's calibration output directly to its RF input. Turn on the spectrum analyzer.

2 Set the spectrum analyzer center frequency to the frequency of the calibration output.

3 Set the frequency span to 10 MHz and activate a marker.

4 Place the marker on the peak of the displayed signal and note the value in dBm.

5 Connect the probe adapter to the calibration output.

6 Connect the probe output to the RF input on the analyzer.

7 Connect the probe power cable to a power source.

8 Plug the probe tip into the probe adapter.

9 Place the marker on the peak of the displayed signal and compare the signal level in dBm to that measured in step 4. The probe should not cause more than 5 dBm of signal loss.

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5 Performance Tests

The procedures in this chapter test the probe to ensure that it meets the warranted specifications listed in the data sheet (see "Specifications and Characteristics" on page 17). The "Test Record" on page 45 provides space to record the test results. Each of the tests can be performed without access to the interior of the probe. Follow the procedures, record data on the ""Test Record" on page 45, perform the calculations, and determine pass or fail for each test item. All tests must pass for the performance test to be verified.

NOTE The performance tests in this chapter cover the specifications for a standard 85024A probe. If the serial number label indicates an option, contact Keysight Technologies for applicable specifications. Refer to "Sales and Technical Support" on page 6 for a list of Keysight Technologies sales and service offices.

Recommended Test Equipment

Table 5-1 lists the equipment that is recommended for use in performance testing of the probe. Other equipment may be substituted if its specifications meet or exceed the specifications listed in the “Critical Specifications” column.

Table 5-1 Recommended test equipment

Type	Critical specifications	Recommended model or part number
Vector network analyzer	300 kHz to 3 GHz	8714ET/ES, 8753ET/ES, 8753E[a]
Power meter		437B/438A or E4418A/E4419A
Power sensor	300 kHz to 3 GHz –30 dBm to +5 dBm	8482A
Type-N cable, male-to-male	50 Ω	8120-8862 or equivalent
Probe adapter	Supplied with probe	11880-60001
Attenuator, type-N, 50 Ω	Any value 10 to 20 dB nominal	8491A/B/C Option 20, Option 10, or equivalent
Type-N Adapter, female-to-female		1250-0777 or equivalent

[a] Many models of network analyzers can be used for these performance tests. The network analyzer must cover the frequency range 300 kHz to 3 GHz, and be capable of power output in the range of –3 to +5 dBm.

Network Analyzer Operation

This section provides some general information for performing basic network analyzer operations. For more specific operating information, refer to your analyzers user's guide.

Presetting the network analyzer

All analyzers have a **[PRESET]** hardkey for this function.

Selecting a transmission (or S21 measurement)

871x family	Press **[MEAS 1]**, then **Transmission** or **Fwd Trans S21**.
8753 family	Press **[Chan 1]** or **[CH 1]**, then **[Meas]** followed by **Transmission** or **TRANS:FWD**.

Setting the frequency range

871x family	Start and stop frequencies are accessed via **[FREQ]**.
8753 family	Start and stop frequencies are accessed via **[Start]** and **[Stop]**.

Setting CW mode for power meter measurements

871x family	Press **[FREQ]** **CW**, then **[MENU]** and set the Trigger mode to **Hold**. To return to normal operation, set the trigger mode to **Continuous** and define start and stop frequencies.
8753 family	Press **[Menu]** or **[Sweep Setup]** to access both the sweep and trigger functions. The **CW FREQ** softkey activates CW mode, press **TRIGGER MENU** then **HOLD**. To return to normal operation, change the trigger mode to **CONTINUOUS**, **[Menu]** or **[Sweep Setup]**, then **SWEEP TYPE MENU** followed by **LIN FREQ**.

Setting the output power level

871x family	Press **[POWER]**.
8753 family	Press **[Menu]** or **[Sweep Setup]** to access **Power**.

Performing a response calibration

871xC and 871xET	Press **[CAL]**, then **Response**. Press **Measure Standard** when the through cable is connected.
871xES	Press **[CAL]**, **User Response**, then **Response**. Press **Measure Standard** when the through cable is connected.
8753 family	Press **[Cal]**, **CALIBRATE MENU**, then **Response**. Press **THRU** when the through cable is connected.

Median Gain and Frequency Response Flatness

Specifications (at 25 °C ±5 °C)	
Median gain over 300 kHz to 1 GHz	0 dB ±1.25 dB
Frequency response flatness (relative to median gain)	
300 kHz to 1 GHz	±1.25 dB
1 GHz to 3 GHz	±2.5 dB

Description

This test procedure performs a response calibration on the analyzer and then measures the gain of the probe over frequency. Maximum and minimum gains in two different frequency bands are used to determine the probe performance.

Procedure

1. Preset the analyzer using the **[PRESET]** hardkey.
2. Set the frequency sweep range for 300 kHz to 3 GHz.
3. Set the analyzer for a transmission (S21) measurement.
4. Connect a type-N cable between the output port and input port on the analyzer.
5. Perform a response calibration on the analyzer. The trace on the analyzer should now be a flat line at 0 dB.
6. Disconnect the cable from the output port of the analyzer. Connect the type-N barrel to the free end of the cable.
7. Connect the probe adapter to the output port of the analyzer. Connect the probe between the probe adapter and the type-N barrel. Plug the probe power cable into the front panel of the analyzer.

8 Read the following four values from the trace on the analyzer and enter the values on the "Test Record" on page 45. Use the network analyzer marker functions as needed.

Maximum gain in dB over the frequency range of 300 kHz to 1 GHz (A).

Minimum gain in dB over the frequency range of 300 kHz to 1 GHz (B).

Maximum gain in dB over the frequency range of 1 GHz to 3 GHz (C).

Minimum gain in dB over the frequency range of 1 GHz to 3 GHz (D).

Perform the calculations indicated on the test record to determine the results of the test.

Gain Compression

Specifications (at 25 °C ±5 °C)	<1.0 dB at 0.3 V Peak
In a 50 Ω system	0.3 V Peak = –0.458 dBm

Description

This test identifies the frequency of greatest compression at a signal level of 0.3 V peak (–0.458 dBm). It then uses a power meter to precisely measure the compression at that frequency.

Procedure

1. Select an attenuator to use: its nominal value must be in the 10 to 20 dB range.
2. Plug the power sensor into the power meter and turn on the power meter. Allow them to warm up for 3 minutes.
3. Calibrate and zero the power meter and the power sensor.
4. Preset the analyzer using the **[PRESET]** hardkey.
5. Set up the analyzer to measure transmission (S21) over the 300 kHz to 3 GHz range.
6. Set the power level on the analyzer to 0 dBm.
7. Connect the probe adapter to the output of the analyzer.
8. Connect the output of the probe to the input port of the analyzer. Plug the probe tip into the adapter. Connect the probe power cable to a power source.
9. Perform a response calibration on the analyzer using the probe as the “through cable.” The trace on the analyzer should now be a flat line at 0 dB.
10. Insert the attenuator between the output port of the analyzer and the probe adapter. Reconnect the probe to the probe adapter.
11. Determine the frequency of peak gain on the trace of the analyzer. Record the frequency on the test record.
12. Set the analyzer to CW mode for power meter measurements. Set the CW frequency to the value determined in the previous step.
13. Remove the attenuator from the output port of the analyzer.

14 Connect the power sensor to the output port of the analyzer. Adjust the analyzer power output level to produce a reading of 0.0 dBm on the power meter.

NOTE 0.0 dBm is used to allow for possible inaccuracy of power meters

15 Disconnect the power sensor from the output port of the analyzer. Connect the attenuator to the output port of the analyzer.

16 Connect the probe, the probe adapter, and a barrel between the attenuator and the power sensor. The signal from the analyzer should now go through the attenuator and then the probe before reaching the power sensor. Record the power reading on the "Test Record" on page 45 (item F).

17 Remove the attenuator pad, connect the probe adapter to the output port of the analyzer. Connect the attenuator pad between the probe and the power sensor. The signal from the analyzer should now go through the probe and then the pad before reaching the power sensor. Record the power reading on the "Test Record" on page 45 (item G).

18 Perform the calculation indicated on the test record to determine the result of the test.

Calculating equivalent power

The probe is usually used as a high impedance device. The compression specification is given as a voltage (instead of power) because of the wide range of devices with which the probe may be used. For testing the probe, the probe adapter is used to make the probe input 50 Ω. Using this known impedance, an equivalent power can be calculated.

To find the power level equivalent to the 0.3 peak voltage, perform the following mathematical steps:

Steps	Formula	Example
1 Convert the peak voltage into RMS.?	$\frac{V_{pk}}{1.4142135}$	$\frac{0.3V}{1.4142135} = 0.212132V_{RMS}$
2 Convert the RMS voltage to a raw power.	$\frac{V^2}{R}$	$\frac{(0.212132)^2}{50\Omega} = 0.0009w$
3 Convert the raw power to a power which is relative to 1 mW.	Divide by $0.001w$	$\frac{0.009w}{0.001w} = 0.9$
4 Convert to dBm.	10(LOGx)	10(LOG 0.9) = –0.458 dBm[a]

[a] Therefore, as shown in the example, the equivalent power to 0.3 V peak in a 50 Ω system is –0.458 dBm.

Average Noise Level

Specifications (at 25 °C ±5 °C)	<17 mV RTI (or –23 dBm at probe output)

Description

This test procedure uses a power meter to measure the power level of the probe output when the probe tip is connected through 50 ohms to ground.

Procedure

1. Connect the power sensor to the power meter and allow the power meter to warm up for five minutes.
2. Calibrate and zero the power meter.
3. Enable averaging on the power meter.
4. Connect the power cable on the RF probe to a power source, allow the probe to warm up for at least three minutes.
5. Connect the probe tip adapter to the tip of the probe. (This effectively grounds the probe tip).
6. Connect the RF probe to the power sensor using a type-N barrel.
7. Read the power meter. If the reading is unstable, visually determine the approximate peak value over a period of about twenty seconds. Record that value on the test record.

Test Record

85024A High Frequency Probe Test Record						
Serial number:				**Date:**		
Tested by:				**Temperature:**		
Median gain and frequency response flatness		**Results[a]**		**Limits**		**Pass/ Fail**
				Max	**Min**	
A	Maximum gain over 300 kHz to 1 GHz	dB		N/A	N/A	N/A
B	Minimum gain over 300 kHz to 1 GHz	dB		N/A	N/A	N/A
C	Maximum gain over 1 GHz to 3 GHz	dB		N/A	N/A	N/A
D	Minimum gain over 1 GHz to 3 GHz	dB		N/A	N/A	N/A
E	Median gain (A+B)/2 =	dB		1.25	–1.25	
	LF maximum gain A – E =	dB		1.25	0	
	LF minimum gain B – E =	dB		0	–1.25	
	HF maximum gain C – E =	dB		2.5	–2.5	
	HF minimum gain D – E =	dB		2.5	–2.5	
Gain compression						
	Frequency at maximum gain			N/A	N/A	N/A
F	Pad before probe	dBm		N/A	N/A	N/A
G	Pad after probe	dBm		N/A	N/A	N/A
	Compression, D – E =	dBm		+1.0	N/A	
Average noise level						
		dBm		–23	N/A	

[a] Reminder: Include polarity (+/–) in all recorded values and calculations.

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6 Service

Service Information

The 85024A does not have internal adjustments and should not be opened; it should only be repaired by service-trained personnel. Should it become necessary to return the 85024A for repair or service, contact your nearest Keysight Sales and Service Center. Refer to “Sales and Technical Support” on page 6 of this manual.

Connector Inspection and Cleaning

The following is a brief introduction to the fundamentals of proper connector care.

Proper connector care is essential to making accurate valid measurements.

Inspecting the connectors

Visual and mechanical inspection of the output connector and adapter should be done periodically.

CAUTION **If a bad connector is accidentally attached to a good connector, the good connector can be damaged.**

A connector is bad if one of the following conditions exist:

- It fails the visual examination.
- Connectors do not mate smoothly.

Visual examination

A careful visual inspection should be done often on all device connectors. Vigilance can save money and ensure the best measurements with your equipment.

Examine the connectors for such obvious problems as deformed threads, contamination, or corrosion, concentrating especially on the contacting surfaces. Look for burrs, scratches, rounded shoulders and similar signs of wear and damage. Any problem you can see is sufficient to cause degraded performance.

Cleaning connectors

CAUTION Always wear an anti-static wrist strap and work on an anti-static bench mat when cleaning the probe's outer connectors. Cleaning a connector requires you to touch the center conductor of the connector with a swab. The danger of introducing static electricity into the output connector center conductor must be completely eliminated. Do not clean the adapter when it is connected to the probe.

Clean connectors are essential for ensuring the integrity of RF and microwave coaxial connections. Use the following procedure to clean the connectors in this kit:

1 Use compressed air or nitrogen

Use compressed air (or nitrogen) to loosen particles on the connector mating plane surfaces. Clean air cannot damage a connector, or leave particles or residues behind.

WARNING Always use protective eyewear when using compressed air or nitrogen.

You can use any source of clean, dry, low-pressure compressed air or nitrogen that has an effective oil-vapor filter and liquid condensation trap placed just before the outlet hose. Ground the hose nozzle to prevent electrostatic discharge, and set the air pressure to less than 414 kPa (60 psi) to control the velocity of the air stream. High-velocity streams of compressed air can cause electrostatic effects when directed into a connector.

2 Clean the connector threads

Use a lint-free swab or cleaning cloth moistened with isopropyl alcohol to remove any dirt or stubborn contaminants on a connector that cannot be removed with compressed air or nitrogen.

a Apply a small amount of isopropyl alcohol to the lint-free cleaning swab.

b Clean the connector threads.

c Let the alcohol evaporate, then blow the threads dry with a gentle stream of clean, low-pressure compressed air or nitrogen.

WARNING Isopropyl alcohol is extremely flammable, causes irritation, may cause eye damage, and is harmful if swallowed or inhaled. It may be harmful if absorbed through the skin. Keep away from heat, sparks, and flame. Avoid contact with eyes, skin, clothing. Avoid breathing vapor. Keep in tightly closed container. Use with adequate ventilation. Wash thoroughly after handling. In case of fire, use alcohol foam, dry chemical, or carbon dioxide: water may be ineffective. In case of spill, soak up with sand or earth. Flush spill area with water.

Dispose of isopropyl alcohol in accordance with all applicable federal, state, and local environmental regulations.

3 Clean the mating plane surfaces

Apply a small amount of isopropyl alcohol to a new swab and clean the center and outer conductor mating plane surfaces. When cleaning a female connector, avoid snagging the swab on the center conductor contact fingers by using short strokes.

4 Dry the connector

After cleaning, blow the connector dry with a gentle stream of clean compressed air or nitrogen. Always completely dry a connector before you reassemble or use it.

5 Reinspect

Inspect the connector again to make sure that no particles or residue are present.

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