

Agilent Technologies
Z5602A Option H24/H35/H51
50 MHz Precision Power Reference

**Agilent Technologies
Z5602A Option H24/H35/H51
50 MHz Precision Power Reference**

User's and Service Guide

Use this manual with the following document:

**E4440A Calibration and Adjust Software Getting Started Guide
Part Number E4440-90050**

Agilent Technologies Part Number: Z5602-90005

Printed in USA June 2002

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Agilent Technologies

Z5602A Option H24/H35/H51

What You Will Find In This Chapter

This chapter provides the following information about your new Agilent Z5602A Option H24/H35/H51 Precision Power Reference.

- Description
- Checking the Shipment

Description

The Agilent Z5602A Precision Power Reference is a portable 50 MHz sine wave source that requires a very short warm-up time. Traditionally, the process to determine the amplitude accuracy of a source used to calibrate a device under test (DUT) involved power meter measurements and associated calculations to determine the uncertainty of the power meter, the interconnect cables and the VSWR effects of the power meter/source and source/DUT. The Agilent Z5602A Precision Power Reference can achieve the same accuracy as the calibration source built into a power meter, and mates directly with the Type-N female connectors on the spectrum analyzer inputs. The Precision Power Reference greatly reduces the measurement uncertainties mentioned above.

The Precision Power Reference is available in three different connector types. Each Precision Power Reference has a power cable that can be directly plugged into the probe power outlet (-12.6V, +15V) on a spectrum analyzer or other instruments with the probe power feature.

Additionally, the small size and portability of the Precision Power Reference adds to the potential for use in automated production test systems.

Checking the Shipment

After the contents have been unpacked, it is recommended that the original packaging materials are kept so they may be used if the contents should need to be transported.

Check the items received against Table 1-1 below to make sure that you have received the proper option in your shipment. For shipping and packaging issues contact your nearest Agilent Technologies sales or service office. Refer to [“Contacting Agilent” on page 3 -2](#) .

Table 1-1 Option Numbers With Connector Types

Option Number	Connector	Output Power
H24	2.4 mm (f)	-25 dBm
H35	3.5 mm (f)	-25 dBm
H51	Type-N (m)	-25 dBm

What You Will Find In This Chapter

This chapter contains the following sections:

- Setup
- Connecting the Precision Power Reference
- Operation
- Specifications

Setup

NOTE

This guide uses these conventions to indicate keys on the front panel of the spectrum analyzer:

[HARDKEY] = Labeled key on the instrument front panel

(SOFTKEY) = Unlabeled key whose function is indicated on the instrument display

The key labels might be either upper case or lower case.

Connecting the Precision Power Reference

While the spectrum analyzer is powered on, attach the Precision Power Reference to the RF input on the front panel of the spectrum analyzer. Plug the probe power cable from the reference to the probe power output connector on the front panel of the spectrum analyzer. Refer to [Figure 2-1](#) below.

Perform a factory preset on the spectrum analyzer so that it is in a known state.

Figure 2-1 **50 MHz Precision Power Reference Connection to the Spectrum Analyzer**



Operation

The PSA series spectrum analyzers requires the Z5602A Option H24/H35/H51 when adjusting the amplitude of the internal 50 MHz reference.

The following example illustrates how the H51 version of the Precision Power Reference can be used to check the amplitude accuracy of the Agilent E4440A spectrum analyzer at 50 MHz.

Assure the spectrum analyzer has been turned on for at least 30 minutes.

Perform the following keystrokes on the front panel of the spectrum analyzer. Refer to the previous section “[Setup](#)” on [page 2](#) for proper keystroke conventions.

Procedure

Press:

[SYSTEM], (Alignments), (Align All Now) to trigger an alignment on the spectrum analyzer.

Connect the Precision Power Reference to the spectrum analyzer as detailed in [Figure 2-1](#).

To view the Precision Power Reference signal, set the spectrum analyzer controls as follows:

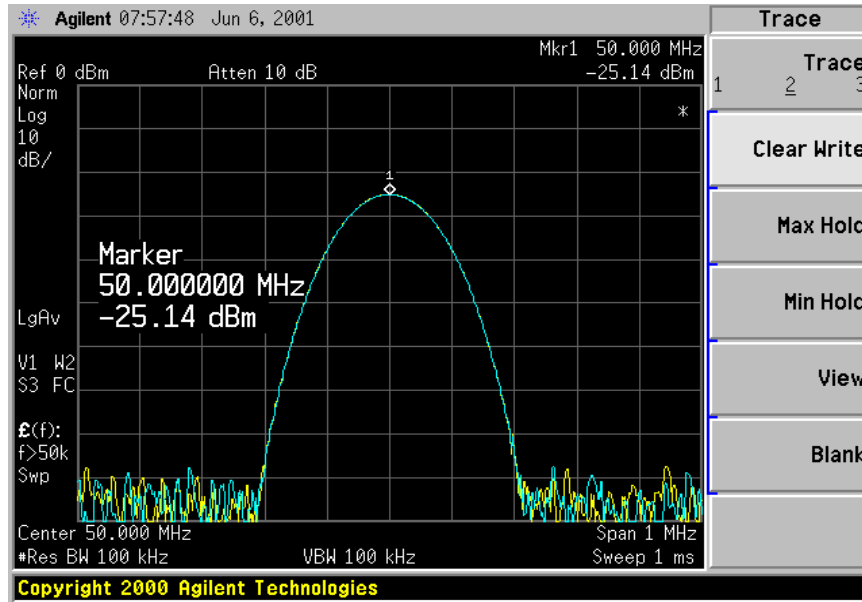
Press:

[Frequency], [5,0] (MHz), [Span], [1] (MHz), [Single], [Peak Search]

Compare the signal amplitude displayed on the spectrum analyzer to the power level shown on the calibration sticker attached to the Precision Power Reference. For example, the spectrum analyzer marker value might be -25.07 dBm, and the calibration sticker on your Precision Power Reference might show -25.009 dBm. Therefore, the spectrum analyzer amplitude error is -0.061 dB.

Refer to [Figure 2-2 on page 5](#) for an example of the signal on the display of the spectrum analyzer.

Figure 2-2 Agilent Z5602A Option H51 Signal



Specifications

The specifications for the Agilent Z5602A Option H24/H35/H51 Precision Power References are listed below.

The warm up time for the Precision Power Reference typically is immediate once powered on.

Table 2-1 50 MHz Precision Power Reference Specifications

Parameter	Specifications ^a		
	H24	H35	H51
Option	H24	H35	H51
Connector Type	2.4 mm	3.5 mm	Type-N
Power Level	-25 dbm	-25 dbm	-25 dbm
Frequency Drift	$ \Delta f \leq 2.5 \text{ KHz}$	$ \Delta f \leq 2.5 \text{ KHz}$	$ \Delta f \leq 2.5 \text{ KHz}$
Typical VSWR	1.06	1.06	1.06
Output Power Variation Over 20 °C – 30 °C	$\pm 0.004 \text{ dBm}$	$\pm 0.004 \text{ dBm}$	$\pm 0.004 \text{ dBm}$
Output Power Variation Over 0 °C – 55 °C	$\pm 0.02 \text{ dBm}$	$\pm 0.02 \text{ dBm}$	$\pm 0.02 \text{ dBm}$
Total Harmonic Content	$< -45 \text{ dBc}$	$< -45 \text{ dBc}$	$< -45 \text{ dBc}$
Amplitude Error Due to Harmonic Content	$< 0.0001 \text{ dB}$	$< 0.0001 \text{ dB}$	$< 0.0001 \text{ dB}$

a. The recommended cal cycle on the Agilent Z5602A Precision Power Reference is 1 year.

Service, Safety, and Regulatory Information

Service

For service, refer to "[Contacting Agilent](#)" on page 2.

Safety and Regulatory Information

For safety and regulatory information, refer to the Getting Started Guide for the E4440A Performance Spectrum Analyzer, part number E4440-90009.

Contacting Agilent

Online assistance: www.agilent.com/find/assist			
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