Agilent Technologies
E9300A Option H25

User's and Service Guide Supplement

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24 GHz E-Series Power Sensor

Use this manual with the following document:
E9300A Power Sensor Operating and Service Guide

Agilent Technologies

Manufacturing Part Number: E9300-90028
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Warranty Statement

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Safety Notes

The following safety notes are used throughout this document. Familiarize yourself with each of these notes and its meaning before performing any of the procedures in this document.

WARNING	**Warning denotes a hazard. It calls attention to a procedure which, if not correctly performed or adhered to, could result in injury or loss of life. Do not proceed beyond a warning note until the indicated conditions are fully understood and met.**

CAUTION	Caution denotes a hazard. It calls attention to a procedure that, if not correctly performed or adhered to, could result in damage to or destruction of the instrument. Do not proceed beyond a caution sign until the indicated conditions are fully understood and met.

Definitions

- Specifications describe the performance of parameters covered by the product warranty (temperature –0 to 55 °C, unless otherwise noted.)
- *Typical* describes additional product performance information that is not covered by the product warranty. It is performance beyond specification that 80% of the units exhibit with a 95% confidence level over the temperature range 20 to 30 °C. Typical performance does not include measurement uncertainty.
- *Nominal* values indicate expected performance or describe product performance that is useful in the application of the product, but is not covered by the product warranty.

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General Information

Description

The Agilent E9300A Option H25 replaces the Type-N RF input connector of the standard E9300A with a 3.5 mm connector. Option H25 also adds an external 8493C 010 10 dB attenuator which shifts the power range from –50 dBm to +30 dBm and extends the upper frequency range to 24 GHz. The E9300A Option H25 is shipped with a 3.5mm to Type-N connector adapter (Agilent part number 08485-60005) for connection to the 50 MHz Reference of the Power Meter. This supplement documents the differences between the E9300A Option H25 and the standard E9300A. For complete information about connecting and using the E9300A, refer to the *E9300A Power Sensors Operating and Service Guide*.

NOTE **Limitations:**

1) Special handling is required to avoid loosening the external attenuator locking collar. Avoid shock and vibration.

2) Where noted, all specifications which apply at 18 to 24 GHz are characteristic except under controlled conditions (25 °C ± 5 °C).

Specifications

All specifications for the E9300A Option H25 are identical to the E9300A with the following exceptions:

Table 1 Frequency Range and Connector Type

Frequency Range	50 MHz to 24 GHz
Connector	3.5 mm
Power Range	10 nW to 1W (–50 dBm to +30 dBm)

Table 2 Maximum SWR (25 °C ± 10 °C)

Frequency	SWR
50 MHz to 2 GHz	1.13
2 GHz to 14 GHz	1.19
14 GHz to 16 GHz	1.25
16 GHz to 18 GHz	1.26
18 GHz to 24 GHz	1.30[1]

1. Characteristic

Table 3 Maximum SWR (0 °C to +55 °C)

Frequency	SWR
50 MHz to 2 GHz	1.15
2 GHz to 14 GHz	1.20
14 GHz to 16 GHz	1.25
16 GHz to 18 GHz	1.27
18 GHz to 24 GHz	1.30[1]

1. Characteristic

Max DC Volts: 10 Volts

NOTE Maximum Calibration Factor uncertainties are shown in the following tables. The calibration report that is shipped with each power sensor indicates the Cal Factor uncertainty data for that specific sensor as measured at the factory. Refer to the *E9300A Power Sensors Operating and Service Guide (E9300-90016)* for more information about Calibration Factor and Reflection Coefficient data.

Table 4 Cal Factor Uncertainty (Low Power Path, –50 dBm to 0 dBm)

Frequency	Uncertainty (25 °C ±10 °C)	Uncertainty (0 °C to +55 °C)
50 MHz to 500 MHz	± 1.6%	± 2.0%
500 MHz to 1.2 GHz	± 1.8%	± 2.5%
1.2 GHz to 6 GHz	± 1.7%	± 2.0%
6 GHz to 14 GHz	± 1.8%	± 2.0%
14 GHz to 18 GHz	± 2.0%	± 2.2%
18 GHz to 24 GHz	± 3.0%[1]	± 3.5%[1]

1. Characteristic (except ± 5 °C) (25 °C ± 5 °C)

Table 5 Cal Factor Uncertainty (High Power Path, 0 dBm to +30 dBm)

Frequency	Uncertainty (25 °C ±10 °C)	Uncertainty (0 °C to +55 °C)
50 MHz to 500 MHz	± 2.3%	± 3.5%
500 MHz to 1.2 GHz	± 2.8%	± 4.5%
1.2 GHz to 6 GHz	± 2.3%	± 2.6%
6 GHz to 14 GHz	± 2.4%	± 2.8%
14 GHz to 18 GHz	± 2.7%	± 3.8%
18 GHz to 24 GHz	± 3.5%[1]	± 4.5%[1]

1. Characteristic (except ± 5 °C) (25 °C ± 5 °C)

Safety and Service Information

Introduction

Review this product and related documentation to familiarize yourself with safety markings and instructions before you operate the instrument. This product has been designed and tested in accordance with international standards.

Before Applying Power

Verify that the product is configured to match the available main power source. If this product is to be powered by autotransformer, make sure the common terminal is connected to the neutral (grounded) side of the ac power supply.

Service

The Agilent E9300A Option H25 has no field serviceable parts. If you need service or calibration for your power sensor, you must return it to Agilent Technologies. A list of Agilent sales and service offices can be found on Page 9.

Shipping Instructions

You must always call the Agilent Technologies Instrument Support Center to initiate service before retuning your instrument to a service office. See “Contacting Agilent” on page 9. Always transport or ship the instrument using the original packaging if possible. If not, comparable packaging must be used. Attach a complete description of the failure symptoms.

Warnings

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

Warnings applicable to this instrument are:

WARNING **If this instrument is not used as specified, the protection provided by the equipment could be impaired. This instrument must be used in a normal condition (in which all means for protection are intact) only.**

WARNING **For continued protection against fire hazard replace line fuse only with same type and rating:**
• United States—F 3A/250V, Part Number 2110-0780
• Europe—F 3.15A/250V, Part Number 2110-0655
The use of other fuses or material is prohibited.

WARNING **This is a Safety Class I product (provided with a protective earthing ground incorporated in the power cord). The mains plug shall be inserted only into a socket outlet provided with a protective earth contact. Any interruption of the protective conductor, inside or outside the instrument, is likely to make the instrument dangerous. Intentional interruption is prohibited.**

WARNING **The power cord is connected to internal capacitors that may retain dangerous electrical charges for 5 seconds after disconnecting the plug from its power supply.**

WARNING **These servicing instructions are for use by qualified personnel only. To avoid electrical shock, do not perform any servicing unless you are qualified to do so.**

WARNING **The opening of covers or removal of parts is likely to expose dangerous voltages. Disconnect the instrument from all voltage sources while it is being opened.**

WARNING **This product is designed for use in Installation Category II and Pollution Degree 2 per IEC 1010 and 664 respectively.**

WARNING **No operator serviceable parts inside. Refer servicing to qualified personnel. To prevent electrical shock do not remove covers.**

WARNING	**If this product is not used as specified, the protection provided by the equipment could be impaired. This product must be used in a normal condition (in which all means for protection are intact) only.**

Cautions

CAUTION	The CAUTION notice denotes a hazard. It calls attention to an operating procedure, practice, or the like, which if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a CAUTION notice until the indicated conditions are fully understood and met.

Cautions applicable to this instrument are:

CAUTION	Always use the three-prong ac power cord supplied with this instrument. Failure to ensure adequate earth grounding (by not using this cord) can cause instrument damage.

CAUTION	This instrument has autoranging line voltage input; be sure the supply voltage is within the specified range.

CAUTION	Ventilation Requirements: When installing the instrument in a cabinet, the convection into and out of the instrument must not be restricted. The ambient temperature (outside the cabinet) must be less than the maximum operating temperature of the instrument by 4 °C for every 100 watts dissipated in the cabinet. If the total power dissipated in the cabinet is greater than 800 watts, forced convection must be used.

Instrument Markings

	When you see this symbol on your instrument, you should refer to the instrument's instruction manual for important information.
	This symbol indicates hazardous voltages.
	The laser radiation symbol is marked on products that have a laser output.
	This symbol indicates that the instrument requires alternating current (ac) input.
	The CE mark is a registered trademark of the European Community. If it is accompanied by a year, it indicates the year the design was proven.
	The CSA mark is a registered trademark of the Canadian Standards Association.
ISM1-A	This text indicates that the instrument is an Industrial Scientific and Medical Group 1 Class A product (CISPR 11, Clause 4).
	This symbol indicates that the power line switch is ON.
	This symbol indicates that the power line switch is OFF or in STANDBY position.
	This symbol indicates the product meets the Australian Standards.
	Safety Earth Ground. This is a Safety Class I product (provided with a protective earthing terminal). An uninterruptible safety earth ground must be provided from the main power source to the product input wiring terminals, power cord, or supplied power cord set. Whenever it is likely that the protection has been impaired, the product must be made inoperative and secured against any unintended operation.

Contacting Agilent

By internet, phone, or fax, get assistance with all your test and measurement needs.

This information supersedes all prior HP contact information.

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

Americas			
Brazil *(tel)* (+55) 11 3351 7012 *(fax)* (+55) 11 3351 7024	**Canada** *(tel)* +1 877 894 4414 *(fax)* +1 303 662 3369	**Mexico** *(tel)* 1 800 254 2440 *(fax)* 1 800 254 4222	**United States** *(tel)* 800 829 4444 *(alt)* (+1) 303 662 3998 *(fax)* 800 829 4433
Asia Pacific and Japan			
Australia (*tel*) 1 800 225 574 (*fax*) 1 800 681 776 (*fax*) 1 800 225 539	**China** (*tel*) 800 810 0508 (*alt*) 800 810 0510 (*fax*) 800 810 0507 (*fax*) 800 810 0362	**Hong Kong** (*tel*) 800 933 229 (*fax*) 800 900 701	**India** *(tel)* 1600 112 626 (*fax*) 1600 112 727 (*fax*) 1600 113 040
Japan (Bench) (*tel*) 0120 32 0119 (*alt*) (+81) 426 56 7799 (*fax*) 0120 01 2144	**Japan (On-Site)** (*tel*) 0120 802 363 (*alt*) (+81) 426 56 7498 (*fax*) (+81) 426 60 8953	**Singapore** (*tel*) 1 800 275 0880 (*fax*) (+65) 6755 1235 (*fax*) (+65) 6755 1214	**South Korea** (*tel*) 080 778 0011 (*fax*) 080 778 0013
Taiwan (*tel*) 0800 047 669 (*fax*) 0800 047 667 (*fax*) 886 3492 0779	**Thailand** (*tel*) 1 800 2758 5822 (*alt*) (+66) 2267 5913 (*fax*) 1 800 656 336	**Malaysia** (*tel*) 1800 880 399 (*fax*) 1800 801 054	
Europe			
Austria (*tel*) 0820 87 44 11* (*fax*) 0820 87 44 22	**Belgium** (*tel*) (+32) (0)2 404 9340 (*alt*) (+32) (0)2 404 9000 (*fax*) (+32) (0)2 404 9395	**Denmark** (*tel*) (+45) 7013 1515 (*alt*) (+45) 7013 7313 (*fax*) (+45) 7013 1555	**Finland** (*tel*) (+358) 10 855 2100 (*fax*) (+358) (0) 10 855 2923
France (*tel*) 0825 010 700* (*alt*) (+33) (0)1 6453 5623 (*fax*) 0825 010 701*	**Germany** (*tel*) 01805 24 6333* (*alt*) 01805 24 6330* (*fax*) 01805 24 6336*	**Ireland** (*tel*) (+353) (0)1 890 924 204 (*alt*) (+353) (0)1 890 924 206 (*fax*)(+353) (0)1 890 924 024	**Israel** (*tel*) (+972) 3 9288 500 (*fax*) (+972) 3 9288 501
Italy (*tel*) (+39) (0)2 9260 8484 (*fax*) (+39) (0)2 9544 1175	**Luxemburg** (*tel*) (+32) (0)2 404 9340 (*alt*) (+32) (0)2 404 9000 (*fax*) (+32) (0)2 404 9395	**Netherlands** (*tel*) (+31) (0)20 547 2111 (*alt*) (+31) (0)20 547 2000 (*fax*) (+31) (0)20 547 2190	**Russia** (*tel*) (+7) 095 797 3963 (*alt*) (+7) 095 797 3900 (*fax*) (+7) 095 797 3901
Spain (*tel*) (+34) 91 631 3300 (*alt*) (+34) 91 631 3000 (*fax*) (+34) 91 631 3301	**Sweden** (*tel*) 0200 88 22 55* (*alt*) (+46) (0)8 5064 8686 (*fax*) 020 120 2266*	**Switzerland (French)** (*tel*) 0800 80 5353 opt. 2* (*alt*) (+33) (0)1 6453 5623 (*fax*) (+41) (0)22 567 5313	**Switzerland (German)** (*tel*) 0800 80 5353 opt. 1* (*alt*) (+49) (0)7031 464 6333 (*fax*) (+41) (0)1 272 7373
Switzerland (Italian) (*tel*) 0800 80 5353 opt. 3* (*alt*) (+39) (0)2 9260 8484 (*fax*) (+41) (0)22 567 5314	**United Kingdom** (*tel*) (+44) (0)7004 666666 (*alt*) (+44) (0)7004 123123 (*fax*) (+44) (0)7004 444555		

(tel) = primary telephone number; *(alt)* = alternate telephone number; *(fax)* = FAX number; * = in country number 11/16/04