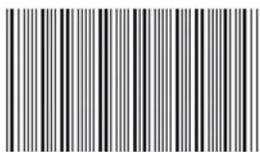

909A dc-18 GHz
909D dc-26.5 GHz
Coaxial Terminations

Operating Note



Manual Part Number: 00909-90034
Printed in USA
April 2005
Supersedes: July 2001
Revision 3.0

Notice

The information contained in this document is subject to change without notice.

Agilent Technologies makes no warranty of any kind with regard to this material, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. Agilent Technologies shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this material.

Agilent Technologies assumes no responsibility for the use or reliability of its software on equipment that is not furnished by Agilent Technologies.

This document contains proprietary information which is protected by copyright. All rights are reserved. No part of this document may be photocopied, reproduced, or translated to another language without prior written consent of Agilent Technologies.

RESTRICTED RIGHTS LEGEND

Use, duplication, or disclosure by the U.S. Government is subject to restrictions as set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.227-7013 for DOD agencies, and subparagraphs (c)(1) and (c)(2) of the Commercial Computer Software Restricted Rights clause at FAR 52.227-19 for other agencies.

Agilent Technologies, Inc.
1400 Fountaingrove Parkway
Santa Rosa, CA 95403-1799, U.S.A.

© Copyright 2000 - 2001, 2005 Agilent Technologies, Inc.

In This Manual...

- **Overview**, [page 1](#)
- **Specifications**, [page 2](#)
- **Environmental Requirements**, [page 3](#)

Warranty

Custom systems are warranted by contractual agreement between Agilent Technologies and the customer.

Certification

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

Assistance

Product maintenance agreements and other customer assistance agreements are available for Agilent Technologies products. Any adjustment, maintenance, or repair of this product must be performed by qualified personnel. Contact your customer engineer after referring to “Contacting Agilent” on the following page.

Contacting Agilent

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			

Safety and Regulatory Information

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.

WARNING

The **WARNING** notice denotes a hazard. It calls attention to a procedure, practice, or the like, that, 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.

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.

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.



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 C-Tick mark is a registered trademark of the Australian Spectrum Management Community.



The CSA mark is a registered trademark of the Canadian Standards Association.

1SM1-A	This text indicates that the instrument is an Industrial Scientific and Medical Group 1 Class A product (CISPER 11, Clause 4).
	This symbol indicates that the power line switch is ON.
	This symbol indicates that the power line switch is in STANDBY position.
	This symbol indicates that the power line switch is OFF.

 **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.

Before Applying Power

Verify that the product is configured to match the available main power source as described in the input power configuration instructions in this manual. 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.

Overview

Description

The Agilent 909A and 909D terminations are low-reflection loads for terminating 50 SZ coaxial systems in their characteristic impedance. The Agilent 909A is extremely broadband, covering the frequency range from dc to 18 GHz. The Agilent 909D is specified to 26.5 GHz, and mode free to 34 GHz. Both terminations find wide use as accessories for broadband measuring instrument and for coaxial instrumentation.

- The Agilent 909A is furnished with a Precision 7 mm connector. This is a sexless connector with low RF leakage and clearly defined reference plane. As an option, the Agilent 909A can be furnished with either male or female Type-N connector interfaces per MIL-STD-348A and IEEE standard 287 GPC. The outer conductors of these Type-N interfaces are made of passivated stainless steel.
- The Agilent 909D has Precision 3.5 mm connector interfaces per IEEE standard 287 GPC.

It is essential that the Agilent 909D be kept in top operating form as it is used for precise measurements. It is recommended that the Agilent 909D be calibrated once a year or after 1000 connections. Due to the simplicity of this product there are no field replaceable parts.

Receiving Inspection

Inspect the packaging and all parts for damage. Keep all packaging materials for return shipment, if necessary. If any part is missing or damaged, notify the carrier and your nearest Agilent Technologies office immediately.

Maintenance

Agilent recommends that the connectors be periodically inspected and cleaned if necessary.

NOTE

This manual assumes you know the proper connector care. If not, refer to "Principles of Microwave Connector Care-Quick Reference Card", (part number 08510-90360). Or, contact your nearest Agilent Technologies sales office for the customer training course: "Understanding Connectors Used With Network Analyzers".

- Agilent 85050A + 24A (on site)
 - Agilent 85050A + 24D (at Agilent Technologies sales office)
-

Specifications

Table 1 *Agilent 909A Specifications*

Specification	Value
Frequency range	dc to 18 GHz
Impedance	50 Ω
Connectors	Precision 7 mm Option 012 Type N (m) Option 013 Type N (f)
Reflection coefficient	<ul style="list-style-type: none"> • 0 to 4 GHz: 0.024 (1.05 SWR) • 4 to 12.4 GHz: 0.048 (1.1 SWR) • 12.4 to 18 GHz: 0.11 (1.25 SWR) Options 012 and 013 ¹ <ul style="list-style-type: none"> • 0 to 4 GHz: 0.029 (1.06 SWR) • 4 to 12.4 GHz: 0.052 (1.11 SWR) • 12.4 to 18 GHz: 0.13 (1.30 SWR)
Power rating	2 W average 300 W peak
Weight	net 80g (3 oz) shipping 2008 (8 oz)
Length	51 mm (2 in)

1. Option 012 furnished with Type N (m) connector. Option 013 furnished with Type N (f) connector.

Table 2 *Agilent 909D Specifications*

Specification	Value
Frequency range	dc to 26.5 GHz
Impedance	500
Connectors	3.5 mm (m) Option 011 3.5 mm (f)
SWR ¹	1.02: (Standard) dc to 3 GHz, (Option 040) dc to 4 GHz 1.036: (Standard) 3 to 6 GHz, (Option 040) 4 to 6 GHz 1.12: (Standard) 6 to 26.5 GHz, (Option 040) 6 to 26.5 GHz
Power rating	2 W average, 20 °C, ² 100 W peak (10 ps max. pulse width) at 20 °C.
Dimensions	23 mm x 4 mm diameter. (0.91 in x 0.16 in)

1. The typical VSWR is 1.1 at 26.5 GHz. Statistically, 90% of the units produced will meet this performance.

2. Derated to 1W average at 75 °C.

Environmental Requirements

Table 3 *Environmental Requirements*

Parameter	Required Values/Ranges
Operating Temperature	
Type-N	20° to 26°C (68° to 79°F)
3.5 mm	15° to 35°C (59° to 95°F)
Storage Temperature	-40° to +75 °C (-40° to +167 °F)
Altitude	
Operation	< 4,500 m (15,000 ft)
Storage	< 15,000 m (50,000 ft)
Relative humidity	Always non-condensing
Operation	0 to 80% (26°C maximum dry bulb)
Storage	
Type-N	0 to 90%
3.5 mm	0 to 95%