

Operating Note

Agilent Technologies 11636B Power Divider DC to 26.5 GHz



Agilent Technologies

Part Number 11636-90001

Printed in USA February 1985

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.

CERTIFICATION

Hewlett-Packard Company certifies that this product met its published specifications at the time of shipment from the factory. Hewlett-Packard further certifies that its calibration measurements are traceable to the United States National Bureau of Standards, to the extent allowed by the Bureau's calibration facility, and to the calibration facilities of other International Standards Organization members.

WARRANTY

This Hewlett-Packard instrument product is warranted against defects in material and workmanship for a period of one year from date of shipment. During the warranty period, Hewlett-Packard Company will, at its option, either repair or replace products which prove to be defective.

For warranty service or repair, this product must be returned to a service facility designated by HP. Buyer shall prepay shipping charges to HP and HP shall pay shipping charges to return the product to Buyer. However, Buyer shall pay all shipping charges, duties, and taxes for products returned to HP from another country.

HP warrants that its software and firmware designated by HP for use with an instrument will execute its programming instructions when properly installed on that instrument. HP does not warrant that the operation of the instrument, or software, or firmware will be uninterrupted or error free.

LIMITATION OF WARRANTY

The foregoing warranty shall not apply to defects resulting from improper or inadequate maintenance by Buyer, Buyer-supplied software or interfacing, unauthorized modification or misuse, operation outside of the environmental specifications for the product, or improper site preparation or maintenance.

NO OTHER WARRANTY IS EXPRESSED OR IMPLIED. HP SPECIFICALLY DISCLAIMS THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

EXCLUSIVE REMEDIES

THE REMEDIES PROVIDED HEREIN ARE BUYER'S SOLE AND EXCLUSIVE REMEDIES. HP SHALL NOT BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, WHETHER BASED ON CONTRACT, TORT, OR ANY OTHER LEGAL THEORY.

ASSISTANCE

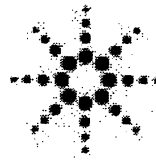
Product maintenance agreements and other customer assistance agreements are available for Hewlett-Packard products.

For any assistance, contact your nearest Hewlett-Packard Sales and Service Office. Addresses are provided at the back of this manual.

Notice

Hewlett-Packard to Agilent Technologies Transition

This documentation supports a product that previously shipped under the Hewlett-Packard company brand name. The brand name has now been changed to Agilent Technologies. The two products are functionally identical, only our name has changed. The document still includes references to Hewlett-Packard products, some of which have been transitioned to Agilent Technologies.



Agilent Technologies

INTRODUCTION

From DC to 26.5 GHz, the HP 11636B provides excellent output power symmetry between the two output ports. Its design provides excellent source match for fault location applications using network analyzers. However, it is not recommended for ratio or source leveling applications.

The HP 11636B provides a symmetrical 6 dB power division. It can also be used as a power combiner: when signals are *input* at the two output ports, the sum of the two signals appears at the input port.

Specifications

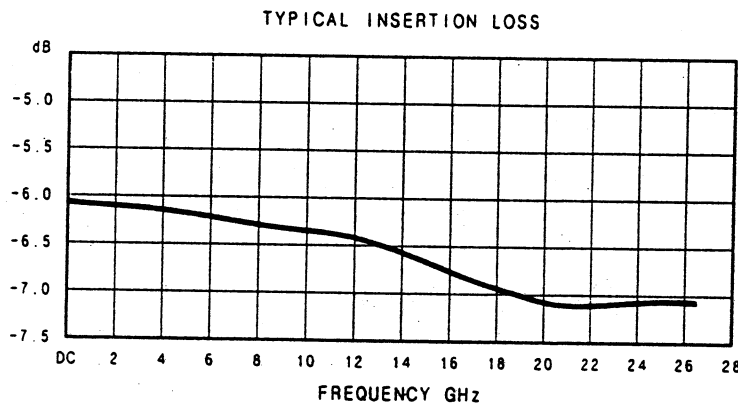
MAXIMUM INPUT POWER: 0.5 W (27 dBm)

FREQUENCY RANGE: DC to 26.5 GHz

**INPUT / OUTPUT SWR: DC to 10.0 GHz: ≤ 1.22
10.0 GHz to 26.5 GHz: ≤ 1.29**

**TRACKING BETWEEN OUTPUT PORTS: DC to 18.0 GHz: < 0.25 dB
18.0 to 26.5 GHz: < 0.50 dB**

MAXIMUM INSERTION LOSS: < 7.5 dB (DC to 26.5 GHz)



PHASE TRACKING BETWEEN OUTPUT ARMS: < 3 Degrees, Typical

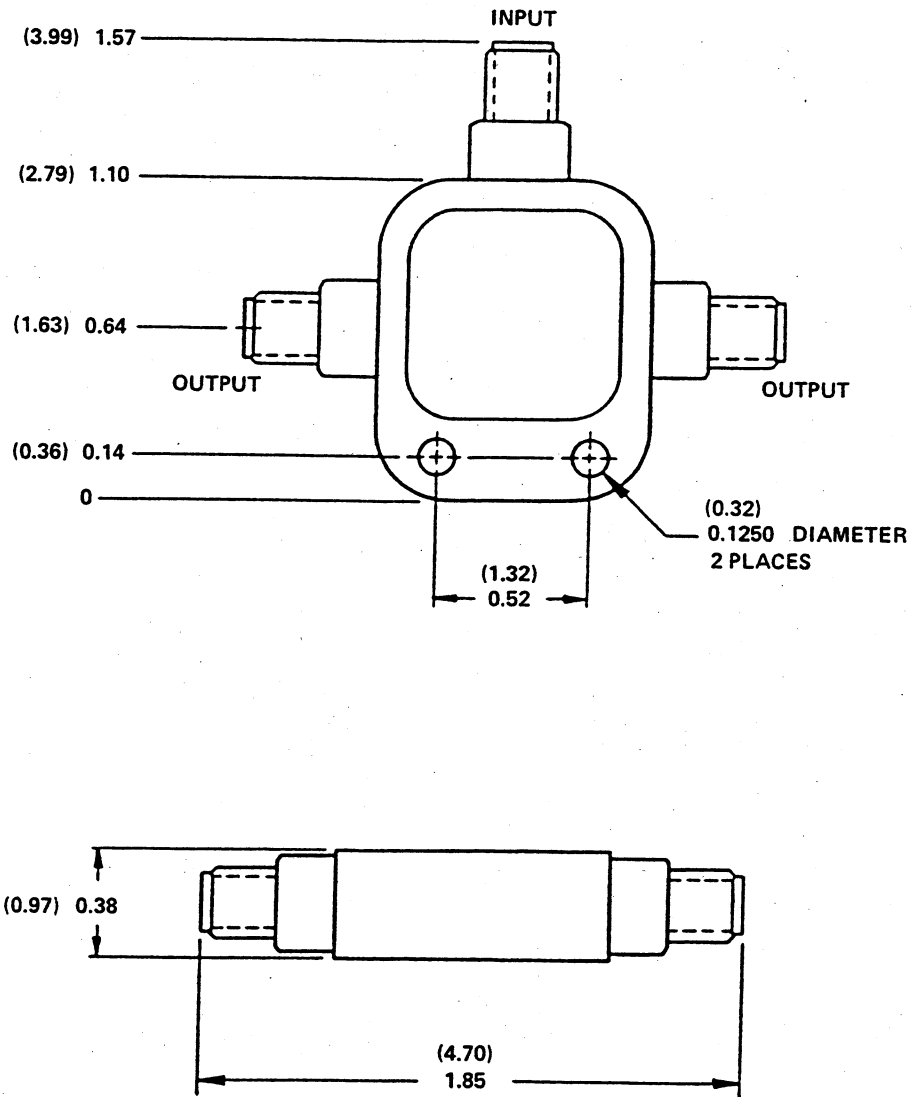
NOMINAL INSERTION LOSS: 6.0 dB + 0.04 dB / GHz

NUMBER OF PORTS: Three

CONNECTORS: 3.5mm on all ports

Specifications (continued)

DIMENSIONS:



NOTE: Dimensions are given in inches (cm) and are maximum unless otherwise specified.

Mating Connectors

The mating connector for a 3.5mm female connector is a 3.5 mm male connector.

CAUTION

An SMA connector will mate with a 3.5mm connector, but only with the following considerations:

1. There are important differences in structure and dimensions between these two connectors:

3.5mm connectors are airline dielectric devices. Only air exists between the center and the outer conductors, and the male or female center conductor is supported by a small plastic *bead* recessed within the body of the connector. SMA connectors have a plastic dielectric that supports the entire length of the center conductor.

The diameters of both the center and the outer conductors differ between SMA and 3.5mm connectors. When an SMA connector is mated with a 3.5mm connector, the connection will exhibit a discontinuity mismatch (SWR) of 1.10 typical at 20 GHz (return loss = 26.5 dB). SMA and 3.5mm connectors should be mated only when a high connector mismatch can be tolerated.

2. SMA connectors are not precision mechanical devices and are especially susceptible to mechanical wear. Therefore, they may easily degrade so that they are out of specification. SMA connectors are also potentially damaging to 3.5mm connectors when mated with them.

A worn or out-of-spec SMA connector can permanently damage its mate **ON THE VERY FIRST CONNECTION**. Therefore, before making any connections, inspect both connectors for wear or damage of any kind. Check the mating plane dimensions with an appropriate connector gage. Both connectors must be within specification. If they are not, permanent damage may result.

Give special attention to the SMA male pin. A male pin that is too long may smash or break the delicate fingers on a 3.5mm female connector. Carefully align the two connectors: when the male contact is concentric with the female, push both of them straight together. Do not rotate or overtighten either center conductor. Turn only the outer nut of the male connector and use a torque wrench (8 in-lb, 90 N-cm) for the final connections.

Refer to Table 1 for a list of precision 3.5mm adapters available from Hewlett-Packard. A precision 3.5mm (M) to precision 3.5mm (M) adapter (HP Part No. 1250-1864), or a precision airline, can be used to extend the life of the HP 11636B connectors.

Operating Environment

The operating environment should be within the following limits:

- Temperature 0° to +55°C (+32° to +131°F)
- Humidity Up to 95% relative
- Altitude Up to 4,572 meters (15,000 feet)

Adjustments

The HP 11636B power divider requires no electrical or mechanical adjustments.

Service

The circuit elements of the HP 11636B are split into three identical channels. A malfunction will usually occur in only one channel and can be verified by moving the connection to another channel of the divider.

An ohmmeter can be used to check the continuity of the inner conductor connections. The resistance from either output center conductor to the input center conductor should be 33.3 ohms + - 2 ohms.

The HP 11636B has no field replaceable parts.

Table 1. Precision 3.5mm adapters available from Hewlett-Packard

Description	Part Number
Precision 3.5mm (M) to N (M)	1250-1743
Precision 3.5mm (M) to N (F)	1250-1750
Precision 3.5mm (F) to N (M)	1250-1744
Precision 3.5mm (F) to N (F)	1250-1745
Precision 3.5mm (M) to Precision 7mm	1250-1746
Precision 3.5mm (F) to Precision 7mm	1250-1747
Precision 3.5mm (M) to Precision 3.5mm (M)	1250-1864
Precision 3.5mm (F) to Precision 3.5mm (F)	1250-1865
Precision 3.5mm (M) to Precision 3.5mm (F)	1250-1866

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

Table 1-1 Contacting Agilent

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

United States
(tel) 1 800 452 4844

Latin America
(tel) (305) 269 7500
(fax) (305) 269 7599

Canada
(tel) 1 877 894 4414
(fax) (905) 282-6495

Europe
(tel) (+31) 20 547 2323
(fax) (+31) 20 547 2390

New Zealand
(tel) 0 800 738 378
(fax) (+64) 4 495 8950

Japan
(tel) (+81) 426 56 7832
(fax) (+81) 426 56 7840

Australia
(tel) 1 800 629 485
(fax) (+61) 3 9210 5947

Asia Call Center Numbers

Country	Phone Number	Fax Number
Singapore	1-800-375-8100	(65) 836-0252
Malaysia	1-800-828-848	1-800-801664
Philippines	(632) 8426802 1-800-16510170 (PLDT Subscriber Only)	(632) 8426809 1-800-16510288 (PLDT Subscriber Only)
Thailand	(088) 226-008 (outside Bangkok) (662) 661-3999 (within Bangkok)	(66) 1-661-3714
Hong Kong	800-930-871	(852) 2506 9233
Taiwan	0800-047-866	(886) 2 25456723
People's Republic of China	800-810-0189 (preferred) 10800-650-0021	10800-650-0121
India	1-600-11-2929	000-800-650-1101

** For Agilent Internal Reference Only

Customer Order Number

Manufacturing Part Number

11636-90001



Printed in USA

February 1985