

Technical Data

**R752AS/CS/DS, Q/U752A/C/D,
V/W752C/D mm-Wave Waveguide
Directional Couplers**

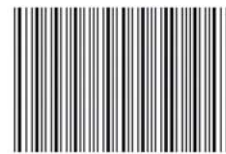
26.5 - 110 GHz



Agilent Technologies

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Hewlett-Packard to Agilent Technologies Transition

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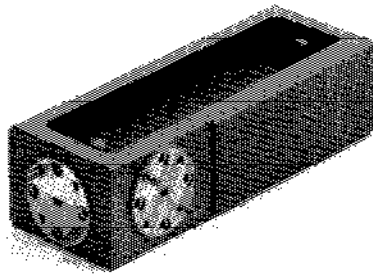
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HP R752AS/CS/DS, Q/U752A/C/D, V/W752C/D mm-Wave Waveguide Directional Couplers

26.5 — 110 GHz

Technical Data



New Performance Standards for mm-Wave Measurements

HP's new 752 series are high performance mm-Wave directional couplers. High performance is achieved by using a split block design which makes closer control of critical dimensions possible. They feature exceptionally high directivity of 33 to 40 dB, low SWR of 1.1 or better, and a smooth coupling variation of no more than ± 0.7 dB. They are available with frequency ranges of 26.5 to 40 GHz, 33 to 50 GHz, 40 to 60 GHz, 50 to 75 GHz and 75 to 110 GHz. The three lower frequency band units are offered in 3, 10 and 20 dB coupling factors, and the two upper band couplers are available with 10 or 20 dB coupling.

When connected in a reflectometer configuration, their high directivity and low SWR will ensure accurate measurements of reflection and/or transmission. To sample or monitor power, these couplers provide flat frequency response and low SWR

which allows accurate measurements of incident or reflected power.

Directivity is the most important parameter of a coupler. Testing directivity is a major challenge, especially at mm-Wave frequencies. Since waveguide flanges are an important limiting factor in directivity, Hewlett-Packard has chosen to include flange effects in the directivity specification. The coupler directivity is measured with a sliding load connected to

it. Testing done this way more accurately represents actual measurement conditions. Thus, when connecting a test device to the coupler, you are assured that the coupler still meets its directivity specification.

Performance of every unit is verified on a specially configured mm-Wave Automatic Network Analyzer that has been calibrated with standards that are traceable to National Institute of Standards and Technology (NIST, formerly NBS).

Specifications

HP Model #	R752AS/CS/DS	Q752A/C/D	U752A/C/D	V752C/D	W752C/D
Freq Range (GHz)	26.5—40	33—50	40—60	50—75	75—110
Coupling (dB)	3, 10, 20	3, 10, 20	3, 10, 20	10, 20	10, 20
Coupling Variation	± 0.6	± 0.7	± 0.7	± 0.7	± 0.7
Mean Coupling Accuracy	± 0.7	± 0.7	± 0.7	± 0.7	± 0.7
Directivity (dB)	40	40	39	36	33
(typical)	46	44	42	40	38
SWR Main Guide (max.)	1.05	1.05	1.06	1.08	1.08
SWR (Aux. port)	1.05	1.05	1.06	1.08	1.08
Maximum input power, (W):					
3 dB	1.0	1.0	1.0		
10 dB	5.0	5.0	5.0	3.0	2.0
20 dB	50	50	50	30	20
Fits Waveguide Size:					
EIA	WR-28	WR-22	WR-19	WR-15	WR-10
MIL-W-85/x-xxx	3-006	3-010	3-014	3-017	3-023
Equivalent Flange:					
MIL-F-3922/xxx-xxx	67B-005	67B-006	67B-007	67B-008	67B-010
UG-xxx/U	599	383	383 (mod.)	385	387(mod.)
Dimensions:					
Length	cm. 16.5	14.0	14.0	9.7	9.7
in.	6.5	5.51	5.51	3.82	3.82
Net Wt.	gm. 240	240	240	270	270
lb.	.53	.53	.53	.60	.60

For some applications, such as connecting to the output of a sweeper, a bend or straight waveguide section is required to leave enough space between the coupler and sweeper flanges to allow for connection. HP has available the following accessories to facilitate assembling mm-Wave measurement setups.

HP Model #	Description
R,Q,U897A	H - Plane Bend
R,Q,U897B	E - Plane Bend
R,Q,U,V,W898A	90° R.H. Twist
Q,U898B	90° R.H. Twist
Q,U899A	2.5 cm Straight Section
R,Q,U899B	5.0 cm Straight Section
R899D	10.0 cm Straight Section

A waveguide section will be required to connect two couplers together. See Figure 1 for a detailed drawing of two couplers connected with a straight. A straight, bend or twist will be required for some measurement setups. Figure 2 illustrates a straight section connected to the output of a sweeper.

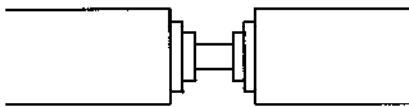


Figure 1. Coupler connected with a straight section.

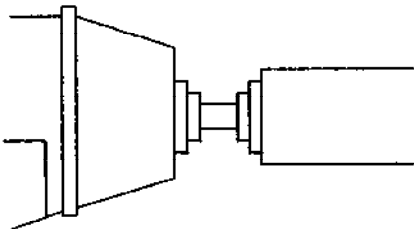
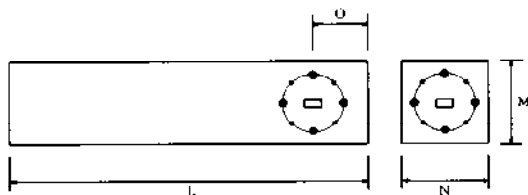


Figure 2. Coupler connected to the output of a sweeper with a straight section.



	L	M	N	O
R	16.50 (6.50)	2.50 (0.98)	3.38 (1.33)	2.40 (0.94)
Q	14.00 (5.51)	3.30 (1.30)	3.38 (1.33)	2.10 (0.83)
U	14.00 (5.51)	3.30 (1.30)	3.38 (1.33)	2.10 (0.83)
V	9.7 (3.82)	2.20 (0.87)	3.05 (1.20)	1.55 (0.61)
W	9.7 (3.82)	2.20 (0.87)	3.05 (1.20)	1.55 (0.61)

Dimensions in cm (inches)

Ordering Information

When ordering, the complete model number must be specified. For example, if a 20 dB coupler that operates to 75 GHz is needed, the HP model number V752D must be specified.

V752D		Coupling Value	
	Freq. Band		
R	26.5 to 40 GHz	A	3 dB
Q	33 to 50 GHz	C	10 dB
U	40 to 60 GHz	D	20 dB
V	50 to 75 GHz		
W	75 to 110 GHz		

3 dB coupling ("A" model suffix) is not available in V or W band couplers.

For more information, call your local HP sales office listed in the telephone directory white pages. Ask for the Test and Measurements Department, or write to Hewlett-Packard:

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Palo Alto, CA 94303-0890
U.S.A.

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Ontario

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Central Mailing Dept.
P.O. Box 529
1180 AM Amstelveen
The Netherlands

Japan
Yokogawa-Hewlett-Packard Ltd.
29-21, Takaido-Higashi 3-chome
Suginami-ku, Tokyo 168

Elsewhere in the World
Hewlett-Packard Company
Intercontinental Headquarters
3495 Deer Creek Road
Palo Alto, CA 94304-1393 U.S.A.

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