

Agilent Waveguide Directional Couplers, 8.2 to 60 GHz, 752 Series

Data Sheet

Features

- High coupling accuracy
- Excellent directivity
- Low SWR

Applications

- Measure reflection coefficient (SWR)
- Mix two signals
- Monitor power
- Isolate signal source or wave meter

Description

High directivity makes the Model 752 particularly well suited for measuring very small reflections and for rapidly adjusting transmission line flatness over the entire wave guide frequency range.

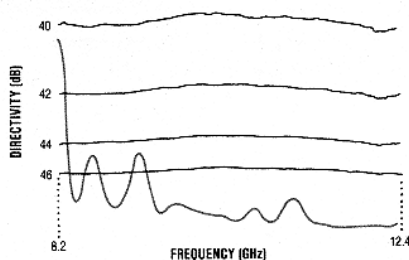


Figure 1. Directivity of an X752C. All couplers are tested over their full band for directivity.

Each coupler has an overall directivity of better than 40 dB (see figure 1), very low reflections, and a smooth coupling variation vs. frequency (see Figure 2).

Performance characteristics are unaffected by humidity, temperature, or time, making these units especially useful as standards of microwave attenuation. Coupling factors are 3, 10, and 20 dB; mean coupling accuracy is ± 0.4 dB (± 0.7 dB for K- and R-bands), and coupling variation vs. frequency is ± 0.5 dB (0.6 dB for R752D). Each coupler is supplied with coupling factor data at five frequencies across the band.

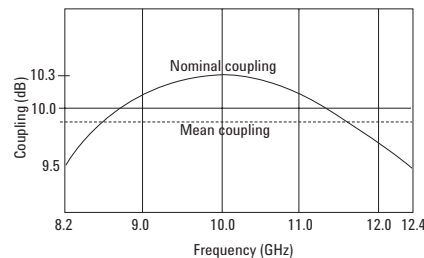
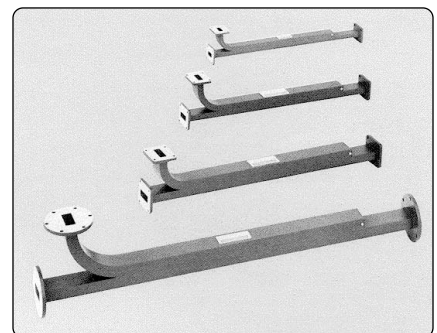


Figure 2. Typical coupling characteristic of model X752C.

Used together and connected back-to-back, the directional couplers are most useful with the 8350 or 8340 Series sweepers in broadband reflection and SWR measurements. One directional coupler samples power traveling to the load, while the other samples power reflected from the load. Used with two 424A crystal detectors, measurements of SWR versus frequency can be made easily. The detected output of the forward coupler is used to level the sweeper, and the detected output of the reverse coupler is presented on an oscilloscope calibrated in SWR.* When used with unlevelled sweepers, the output of both couplers can be applied to the 8510 network analyzer or the 8756 or 8757 scalar network analyzers to display reflection coefficient directly.

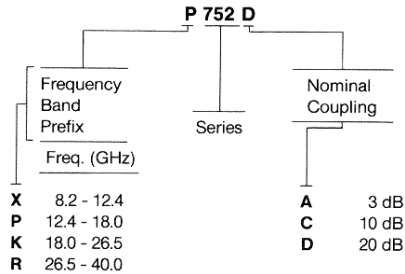


A Matched "Hybrid Tee" with Low SWR

Since the 3 dB coupler has the high directivity of the 10 and 20 dB couplers, it can usually be used in place of the hybrid tees. The 3 dB multi-hole coupler, unlike the hybrid tee, is a matched device, having an output SWR (either arm) of 1.15 or less over a waveguide frequency range.

Ordering Information

For more information on the Agilent U752D waveguide coupler (40 to 60 GHz, 20 dB), please go to www.agilent.com and search on "waveguide coupler".



Waveguide Couplers and Accessories up to 60 GHz

Millimeter wave test equipment and measurement accessories include quality waveguide couplers in the Q band (33 to 50 GHz) and U band (40 to 60 GHz) frequency ranges. The Q and U752A/B/D are split block design couplers that feature exceptionally high directivity of at least 36 dB, low SWR of 1.1 or better and a smooth coupling variation of no more than ± 0.7 dB.

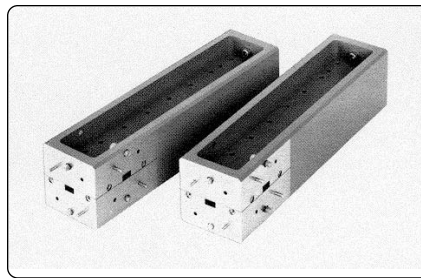


Figure 3. Q752 (33 to 50 GHz) and U752 (40 to 60 GHz) waveguide couplers.

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Frequency Band ¹ (Prefix)	Frequency (GHz)	Fits Waveguide Size		Mean Coupling Accuracy ²	Coupling Variation ³	Directivity ⁴	SWR ^{4,5} Main Guide		Average Power Aux Guide Load (W)	
		Nominal	OD mm (in.)				752A	752C/D		
X	8.2 - 12.4	25.4 x 12.7	(1.0 x 0.5)	WR 90	± 0.4 dB	$\leq \pm 0.5$ dB	≥ 40 dB	≤ 1.1	≤ 1.05	1
P	12.4 - 18.0	17.8 x 9.9	(0.7 x 0.39)	WR 62	± 0.7					1
K†	18.0 - 26.5	12.7 x 6.4	(0.5 x 0.25)	WR 42	± 0.7					0.5
R†	26.5 - 40.0	9.1 x 5.6	(0.36 x 0.22)	WR 28	± 0.7					0.5

Frequency Band ¹ (Prefix)	Length						Weight			
	752		752C		752D		Net		Shipping	
	(mm)	(in.)	(mm)	(in.)	(mm)	(in.)	(kg)	(lb)	(kg)	(lb)
X	424	16 ¹¹ / ₁₆	399	15 ¹¹ / ₁₆	399	15 ¹¹ / ₁₆	0.8	1 ³ / ₄	1.4	3
P	349	13 ³ / ₄	311	12 ¹ / ₄	311	12 ¹ / ₄	0.34	3/4	0.9	2
K†	270	10 ⁵ / ₈	252	9 ⁹ / ₁₆	252	9 ⁹ / ₁₆	0.23	1/2	0.45	1
R†	295	11 ⁵ / ₈	219	8 ⁵ / ₈	222	8 ²³ / ₃₂	0.11	1/4	0.45	1

¹Letter suffix indicates nominal coupling. "A" for 3 dB, "C" for 10 dB, "D" for 20 dB (example: P-band, 3-dB coupling, Model P752A).
²Mean coupling is the average of the maximum and minimum coupling values in the rated frequency range.
³ ± 0.6 dB for R752D.
⁴Swept-frequency tested.
⁵Auxiliary arm SWR is 1.15 except for P, K and R band, for which it is 1.2.
†Circular flange adapters available: HP 11515A for K-band (UG-425) HP 11516A for R-band (UG-381)

The complete list is available at: www.agilent.com/find/contactus

Product specifications and descriptions in this document subject to change without notice.

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Printed in USA, August 12, 2005

5954-6383



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