

MICROWAVE TEST EQUIPMENT



BROADBAND COAX COUPLERS

Multi-Octave coverage with high directivity
778D, 779D



778D

778D dual directional coupler

The HP 778D is a 20-dB dual directional coupler with a frequency range of 100 MHz to 2 GHz. High directivity (36 dB below 1 GHz, 32 dB above) and close tracking (typically 0.7 dB and 4°) of the auxiliary arms make it ideal for reflectometer measurements of complex reflection coefficient. Maximum errors in such measurements are:

Freq. Range (GHz)	Maximum Magnitude Error $\Delta\Gamma_L$	
	Swept Frequency	Fixed Frequency
0.1-1	$\pm(0.015 + 0.02 \Gamma_L + 0.05 \Gamma_L ^2)$	$\pm(0.015 + 0.05 \Gamma_L ^2)$
1-2	$\pm(0.025 + 0.02 \Gamma_L + 0.05 \Gamma_L ^2)$	$\pm(0.025 + 0.05 \Gamma_L ^2)$

Maximum phase error $\approx \sin^{-1}(\Delta\Gamma_L/\Gamma_L)$.
 $|\Gamma_L|$ = reflection coefficient of unknown.

Errors include directivity, source match, and tracking, but do not include any detection errors. They are also based on the following conditions: auxiliary arms terminated in matched loads, the mean of open- and short-circuit readings set to 1.0, and the short-circuit phase measured over a band of frequencies and the mean set to 180°.

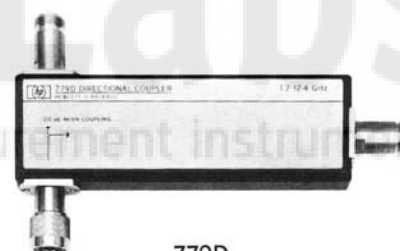
Although the coupling factor increases 6 dB/octave below 100 MHz, directivity remains 36 dB. Thus, the coupler can be used below 100 MHz as well as above.

To accommodate test devices with Type N or APC-7 connectors, a choice of TEST PORT (RF output) connectors is available as indicated in the specifications. With an APC-7 TEST PORT connector the coupler can be adapted to other types of connector. Adapters to OSM®, TNC, NC, GR900, and others are available.

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779D directional coupler

Representing the latest achievement in broadband coaxial couplers, the HP 779D spans more than two octaves from 1.7 to 12.4 GHz with 30-dB directivity below 8 GHz and 26-dB to 12.4 GHz. With increased coupling factor (typically 24 dB) but directivity still 30 dB, the 779D is useful down to 500 MHz. Upper frequency usefulness extends to 18 GHz with a like increase in coupling factor and directivity reduced to about 15 dB.



779D

The 779D is normally supplied with Type N connectors on all ports, as detailed in the table of specifications below. These connectors are stainless steel for long wear and are compatible with all connectors whose dimensions conform to MIL-C-39012 or MIL-C-71. On special order, a precision 7 mm APC-7 connector can be supplied on any, or all, port(s).

778D, 779D Specifications

HP Model	Frequency Range (GHz)	Coupling Attenuation	Coupling Variation	Directivity	SWR	Max Input	Connectors ²	Length in (mm)	Price
778D	0.1-2	20 dB nominal	± 1 dB ¹	Inc. port: 36 dB, 0.1-1GHz, 32 dB, 1-2GHz Refl. port: 30 dB	1.1 all ports	50 W avg, 10 kW pk	Pri line ³ : N-male input, N-female output Aux arms: N-female	16 $\frac{3}{4}$ (425)	\$450 Opt 11: \$475 Opt 12: \$450
779D	1.7-12.4	20 dB ± 0.5 dB	$< \pm 0.75$ dB	30 dB min, 1.7-8 GHz; 26 dB min, 8-12.4 GHz	1.1 all ports	50 W	Pri line ⁴ : N-male input N-female output Aux arms: N-female	7 $\frac{3}{4}$ max (197)	\$550 Opt 010: \$550

¹ Auxiliary outputs typically track within 0.7 dB and 4°.

² All Type N connectors stainless steel, compatible with MIL-C-39012 and MIL-C-71.

³ Option 11: APC-7 output, N-female input.

Option 12: N-male output, N-female input.

⁴ Option 010: N-female input, N-male output. Also, APC-7 on any or all port(s) on special order.