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# 779D Directional Coupler

## Specifications

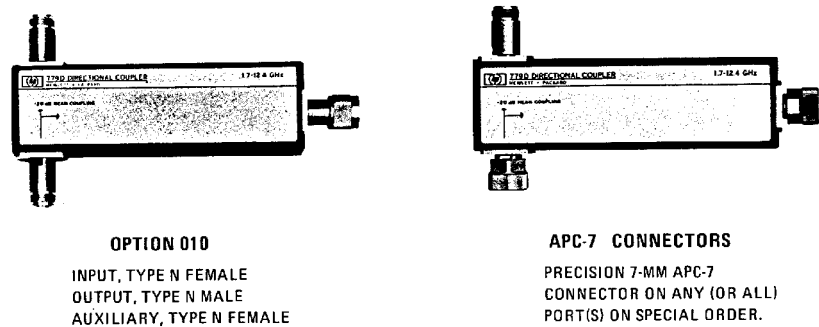
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## Overview

### Description

The 779D directional couplers are three-port passive devices for use in 7-mm, 50-ohm systems. A coupler is essentially a device for sampling power flowing in one direction in a transmission line. Since no coupler is perfect, some power flowing in the opposite direction is also sampled. The rejection of power flowing in the unwanted direction is called directivity and is the most important specification of a directional coupler. This coupler has 26 or 30 dB directivity, depending upon the frequency. Another specification is the forward coupling (usually called just coupling) which is the fractional amount of power transfer in the wanted direction. This coupler has a nominal 20 dB of coupling. These terms are defined in [Figure 2](#), Coupler Terminology. [Figure 2](#) also shows a typical coupling curve. This is a typical curve and not a specification. [Table 1](#) contains the specifications.

The 779D is identified by its serial number found on the back plate (opposite the nameplate). All correspondence with Agilent Technologies Sales/Service offices in regard to this coupler should reference model 779D and this serial number.



*Figure 1 Connector Options*

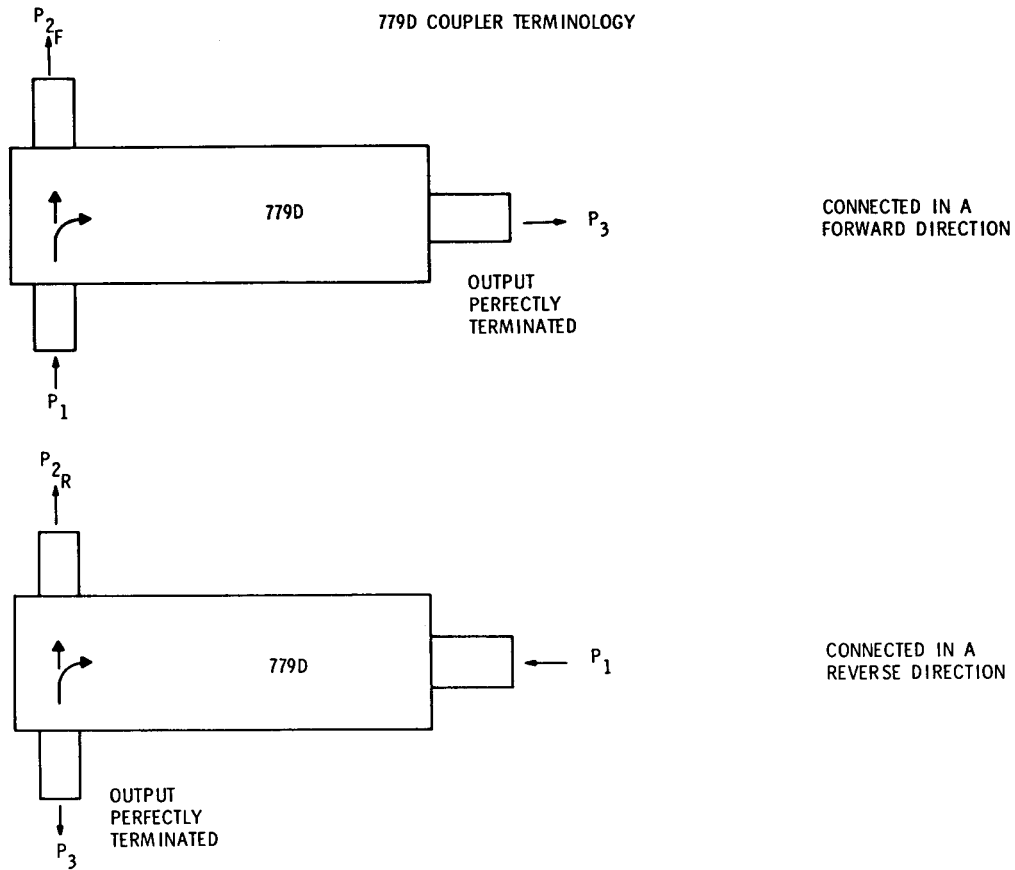
### Manual Changes

This manual provides complete information for any 779D with the serial prefix 901, 922, 929, or 1144A. If your serial prefix is different, a yellow change sheet should be supplied to adapt this manual to your serial prefix coupler.

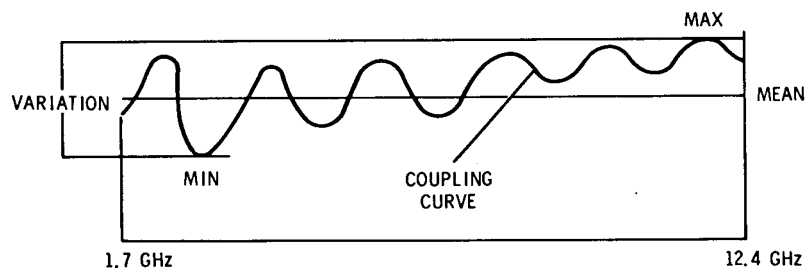
### Port Terminology

The two directly connected ports are known as the primary-line ports. Note that these couplers are polarized, i.e., the input should be at the indicated port. The third, coupled, port is known as the auxiliary port. These couplers may be ordered with any combination of Type N (male or female) connectors or APC-7 connectors on any or all ports.

## Overview



$$\text{COUPLING} = 10 \log_{10} \frac{P_1}{P_{2F}} \text{ dB}$$



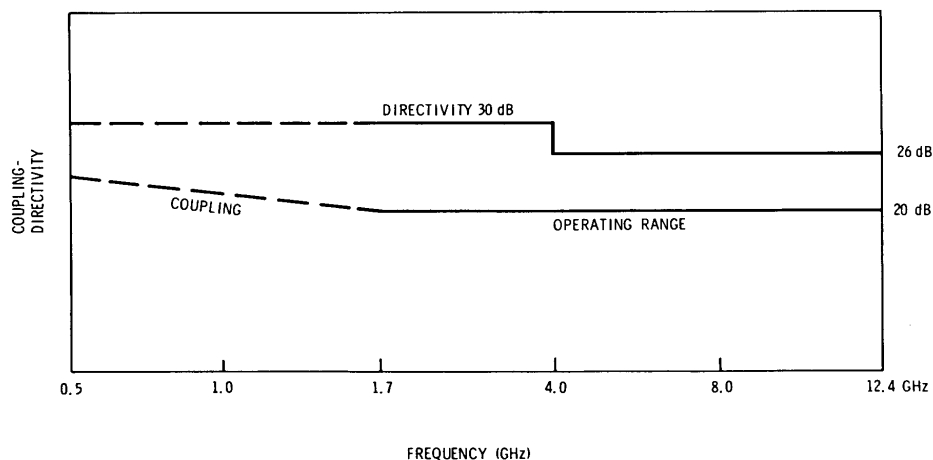
$$\text{MEAN COUPLING} = \frac{\text{dB}_{\max} + \text{dB}_{\min}}{2} \text{ dB}$$

$$\text{COUPLING VARIATION} = \pm (\text{dB}_{\max} - \text{dB}_{\min})$$

$$\text{DIRECTIVITY} = 10 \log_{10} \frac{P_{2F}}{P_{2R}} \text{ dB}, P_1 \text{ held constant}$$

**Figure 2 779D Coupler Terminology**

These couplers may be used in the measurement of reflection coefficient or SWR over a very wide frequency range. Because of the wide frequency range these couplers may also be useful as attenuators.



**Figure 3** *Coupling and Directivity Characteristics of the 779D Directional Coupler*

## Specifications

Specifications for the 779D are shown in [Table 1](#).

**Table 1** *Specifications*

Characteristic	Value
Frequency range	1.7 to 12.4 GHz
Mean coupling	20 dB $\pm$ 0.5 dB
Coupling variation	$\pm$ 0.75 dB
Directivity	>30 dB from 1.7 to 4.0 GHz >26 dB from 4.0 to 12.4 GHz
SWR and Reflection Coefficient	
Primary line	<1.2 (0.091)
Auxiliary line	<1.2 (0.091)
Insertion loss	<0.6 dB
Maximum power input	
Primary line	50 W
Auxiliary line	0.5 W
Connectors	
Input	Type N male
Output	Type N female
Auxiliary	Type N female
Precision	7-mm APC-7 <sup>1</sup> connector on any or all ports(s) on special order.

1. Registered trademark of Bunker Ramo Corporation