

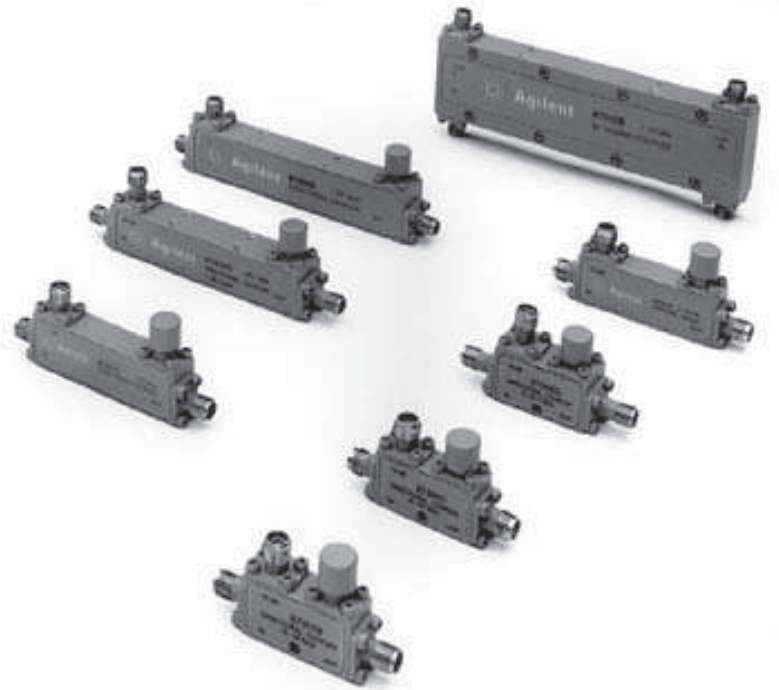
# Agilent 87300B,C,D and 87301B,C,D,E Directional Couplers 87310B Hybrid Coupler

## Product Overview

### Features and Description

- Compact size
- Broadband up to 50 GHz
- Excellent performance

The Agilent Technologies 87300 series of compact, broadband directional/sampling and hybrid couplers are well suited for signal monitoring or, when combined with a coaxial detector, signal leveling. See page 2 for the wide range of product offerings.



### Product Applications

These compact, broadband directional couplers are important components for many microwave measurement systems. Although most modern signal generators and sweepers supply signals whose power levels are stable with respect to frequency, variations in signal level are introduced due to the cable losses (which increase with frequency) and the frequency response of other components in the signal path. Inserting a directional coupler into the system with a suitable microwave detector to supply feedback to the ALC circuit of a signal generator or sweeper provides a leveled signal at a particular point in the system (Figure 1).

Agilent 8474B,C,E detectors offer excellent broad-band frequency response and low SWR for this application. Other applications include power monitoring with an 848X series power sensor connected to the sampling port. Connect the sampled signal port to a microwave counter to monitor frequency or to a signal analyzer for frequency spectrum monitoring (Figure 2).

*(See Figures 1 and 2 on page 4.)*

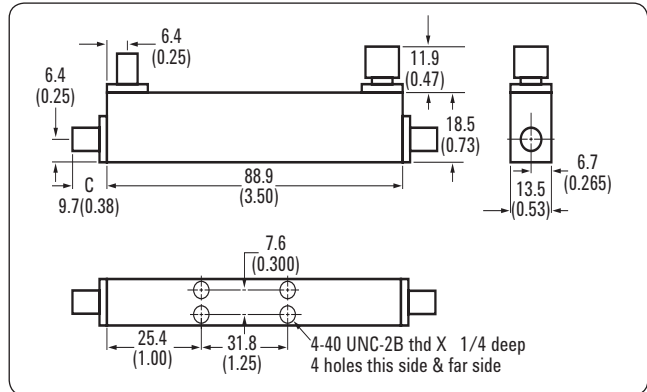


## Specifications

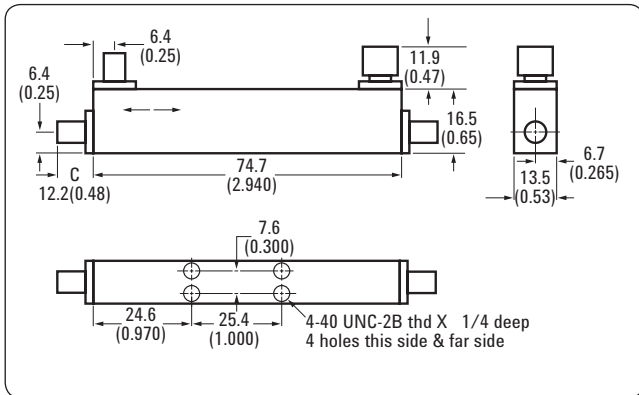
Model	87300B	87300C	87300D
Frequency range (GHz)	1 to 20 GHz	1 to 26.5 GHz	6 to 26.5 GHz
Nominal coupling and variation with respect to output (or coupling factor over insertion loss)	10 ±0.5 dB	10 ±1 dB	10 ±0.5 dB
Frequency sensitivity	±0.35 dB, 1 to 20 GHz	±0.5 dB, 1 to 26.5 GHz	±0.3 dB
Directivity	>16 dB	>14 dB, 1 to 12.4 GHz >12 dB, 12.4 to 26.5 GHz	>13 dB
Maximum SWR	1.35	1.35, 1 to 12.4 GHz 1.50, 12.4 to 26.5 GHz	1.40
Insertion loss	<1.5 dB	<1.2 dB, 1 to 12.4 GHz <1.7 dB, 12.4 to 26.5 GHz	< 1.3 dB
Typical insertion loss (dB, f = freq. in GHz)	0.6+0.04f	0.6+0.04f	.6 + 0.025f
Power rating Average Peak	20 W 3 kW	20 W 3 kW	20 W 3 kW
Connectors	SMA (f)	3.5 mm (f)	3.5 mm (f)
Weight in grams (oz)	74 (2.6)	60 (2.1)	31.2 (1.1)

Model	87301B	87301C	87301D	87301E
Frequency range (GHz)	10 to 46 GHz	10 to 50 GHz	1 to 40 GHz	2 to 50 GHz
Nominal coupling and variation with respect to output (or coupling factor over insertion loss)	10 ±0.7 dB	10 ±0.7 dB	13 ±1 dB	10 ±1 dB
Frequency sensitivity	±0.3 dB	±0.5 dB	±1.2 dB, 1 to 40 GHz	±0.6 dB, 2 to 26.5 GHz ±0.8 dB, 2 to 50 GHz
Directivity	>10 dB	>10 dB	>14 dB, 1 to 20 GHz >10 dB, 20 to 40 GHz	>13 dB, 2 to 26.5 GHz >10 dB, 26.5 to 50 GHz
Maximum SWR	1.80	1.80	1.5, 1 to 20 GHz 1.7, 20 to 40 GHz	1.5, 2 to 26.5 GHz 1.8, 26.5 to 50 GHz
Insertion loss	<1.9 dB	<1.9 dB	<1.2 dB, 1 to 20 GHz <1.9 dB, 20 to 40 GHz	<2 dB
Typical insertion loss	.8+0.022f	.8+0.022f	0.4 + 0.035f	0.55 + 0.025f
Power rating Average Peak	20 W 3 kW	20 W 3 kW	20 W 3 kW	20 W 3 kW
Connectors	2.92 mm (f)	2.4 mm (f)	2.4 mm (f) or 2.92 mm (f) for Option 292	2.4 mm (f)
Weight in grams (oz)	28.4 (1)	28.4 (1)	37 (1.3)	34 (1.2)

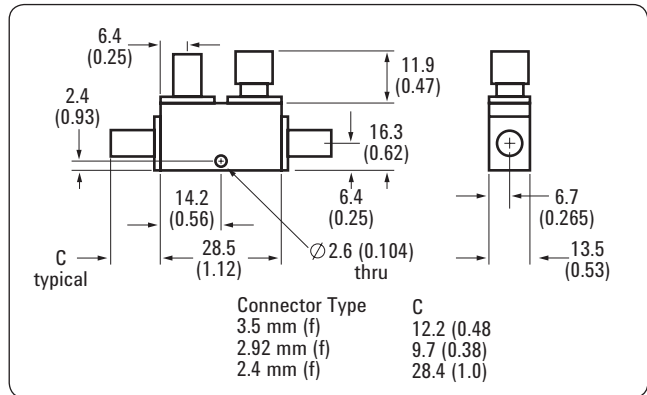
Agilent 87310B		Specifications
Frequency range	1 to 18 GHz	
Coupling	3 dB	
Amplitude imbalance	±0.5 dB at each port, centered at -3 dB	
Phase imbalance	±10 Degrees	
Isolation	>17 dB	
Maximum SWR	1.35	
Insertion loss	<2 dB	
Power rating		
Average	20 W	
Peak	3 kW	
Connectors	SMA (f)	
Weight in grams (oz)	148 (5.2)	



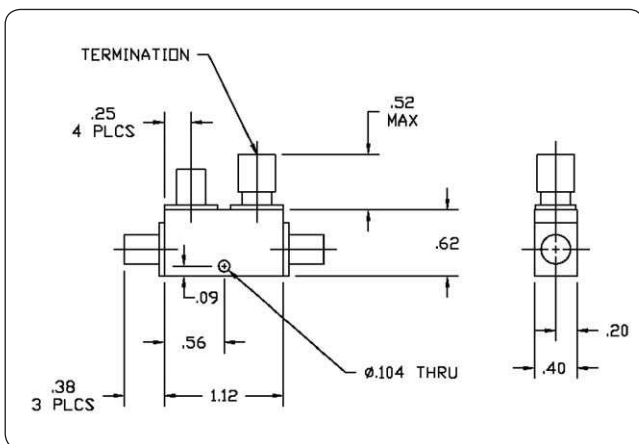
87300B



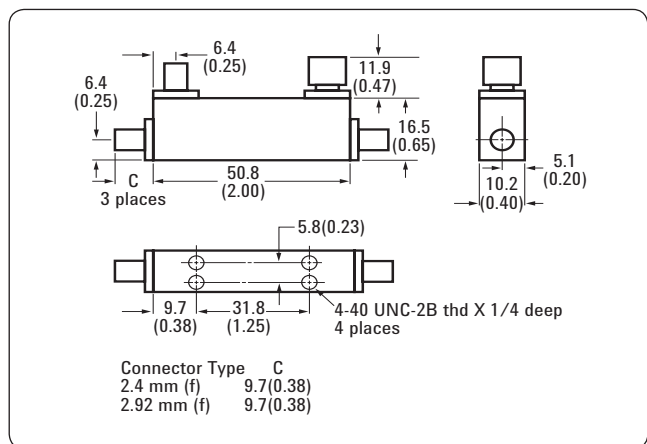
87300C



87300D

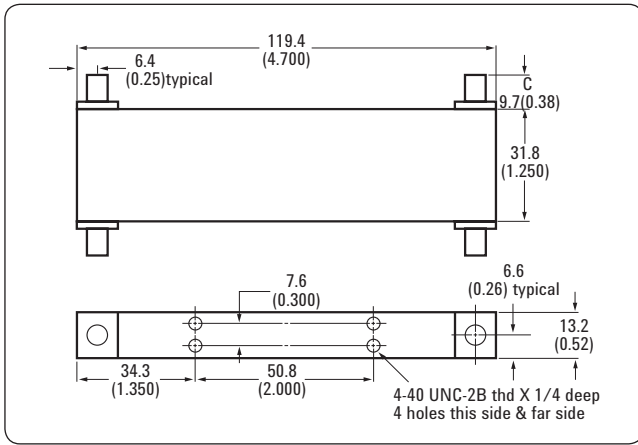


87301B, 87301C



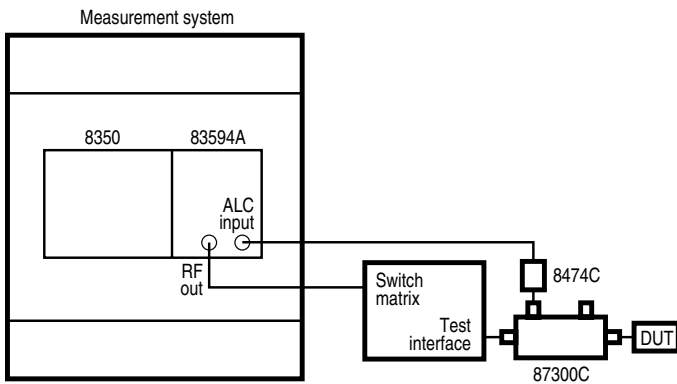
87301D, 87301E

Dimensions are in millimeters (inches) nominal unless otherwise specified

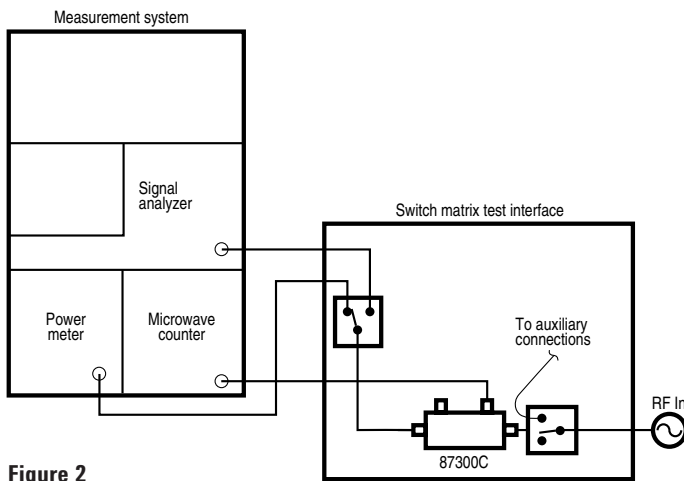


**87310B**

Dimensions are in millimeters (inches) nominal unless otherwise specified



**Figure 1**



**Figure 2**

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