

# Agilent 11691D/11692D Directional Couplers 2 to 18 GHz

Product Overview



## Broadband 20 dB directional couplers

Models 11691D and 11692D high directivity couplers are precision instruments designed for broadband swept reflectometer applications in the 2 to 18 GHz frequency range. With their wide frequency coverage, one of these couplers can replace several couplers without performance degradation, thus adding convenience and economy to swept reflection and transmission coaxial microwave measurements by reducing setup and calibration time. In addition, the broad frequency coverage of the 11691D directional coupler makes it ideal for leveling applications of broadband sources. Its high directivity makes it possible to achieve excellent source matches not achievable with directional detectors.

## Specifications

### *Simultaneous reflection and transmission measurement*

These couplers are ideal in reflectometry measurements. The reflection and transmission characteristics of a device can be measured conveniently from 2 to 18 GHz. Figure 1 shows a test configuration in which an 11692D dual coupler and an 11691D single coupler are used to separate and isolate the incident, reflected, and transmitted signals in a swept-frequency measurement of reflection and transmission. These signals are detected and their ratio displayed on a CRT. The 11691D single coupler compensates in the transmitted signal for the coupling variations "seen" by the reference detector.

The compensated ratio ( $E_{tran}/E_{ref}$ ), being virtually flat, permits high-resolution transmission measurements. These couplers are ideal companions for the 8755 frequency response test set, a 0.1 to 18 GHz detection and display system.

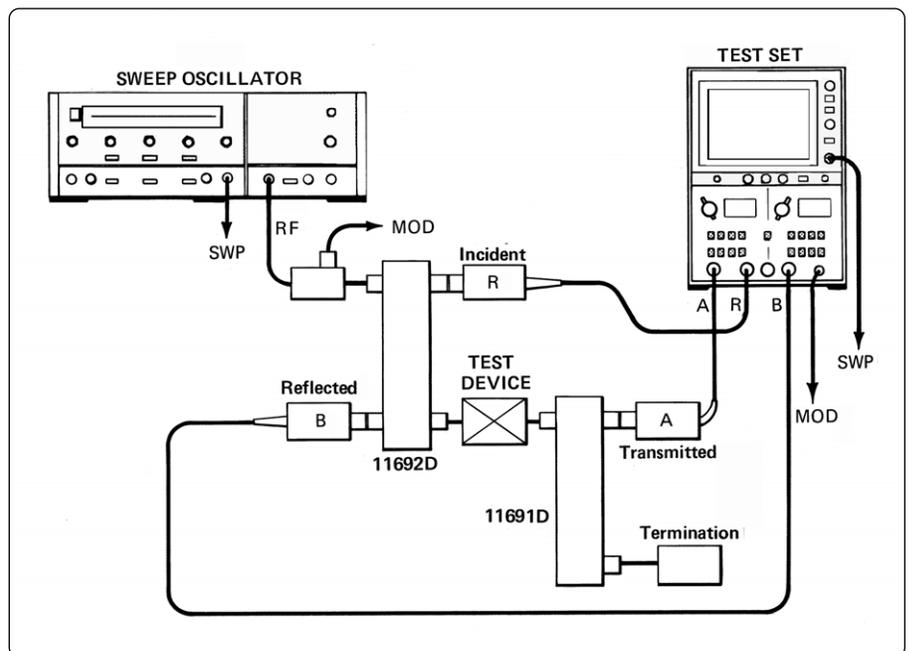


Figure 1. Setup for simultaneous swept measurement of insertion loss (A/R) and return loss (B/R), using 11691D and 11692D couplers.

|   | 11691D  | 11692D  |
|---|---|---|
| <b>Frequency range</b>                                | 2 to 18 GHz   | 2 to 18 GHz   |
| <b>Minimum directivity</b>                            | 2 to 8 GHz: 30 dB   | 2 to 18 GHz: 30 dB  |
| <b>Maximum primary line SWR</b>                       | 8 to 18 GHz: 26 dB <sup>1</sup><br>2 to 12.4 GHz: 1.3<br>12.4 to 18 GHz: 1.40 | 8 to 18 GHz: 26 dB <sup>1</sup><br>2 to 12.4 GHz: 1.3<br>12.4 to 18 GHz: 1.40 |
| <b>Maximum auxiliary port(s) SWR</b>                  | 1.3   | 1.3   |
| <b>Nominal coupling (dB)</b>                          | 20  | 20  |
| <b>Maximum coupling variation with frequency (dB)</b> | ±1 dB   | ±1 dB <sup>2</sup>  |
| <b>Tracking auxiliary arms</b>                        | *   | ±0.7 dB <sup>3*</sup>   |
| <b>Maximum primary line residual loss</b>             | < 2 dB  | < 1.5 dB  |
| <b>Primary line power</b>                             | 50 Ω average  | 50 Ω average  |
| <b>Handling capability</b>                            | 250 Ω peak  | 250 Ω peak  |
| <b>Net weight</b>                                     | 1.93 kg (4 lb, 4 oz)  | 2.72 kg (6 lb, 0 oz)  |
| <b>Dimensions</b>                                     | 404.8 mm (15-15/16 in) L<br>133.4 mm (5-1/4 in) H<br>42.9 mm (1-11/16 in)W    | 404.8 mm (15-15/16 in) L<br>133.4 mm (5-1/4 in) H<br>42.9 mm (1-11/16 in)W    |

### 11691D connector

| Option   | Primary line<br>Input/output | Auxiliary arms |
|----------|------------------------------|----------------|
| Standard | APC-7/APC-7                  | N(f)           |

### 11692D connector options

| Option     | Primary line<br>Input/output | Auxiliary arms<br>Incident/reflection |
|------------|------------------------------|---------------------------------------|
| 11692D-005 | N(f)/APC-7                   | N(f)/N(f)                             |
| 11692D-001 | N(f)/N(f)                    | N(f)/N(f)                             |
| 11692D-002 | N(f)/N(m)                    | N(f)/N(f)                             |
| 11692D-003 | N(f)/APC-7                   | APC-7/APC-7                           |
| 11692D-004 | APC-7/APC-7                  | APC-7/APC-7                           |

### Connectors

The APC-7 and type-N connectors are stainless steel designed for durability. The type-N connectors conform to MIL-C-39012 or MIL-C-71.

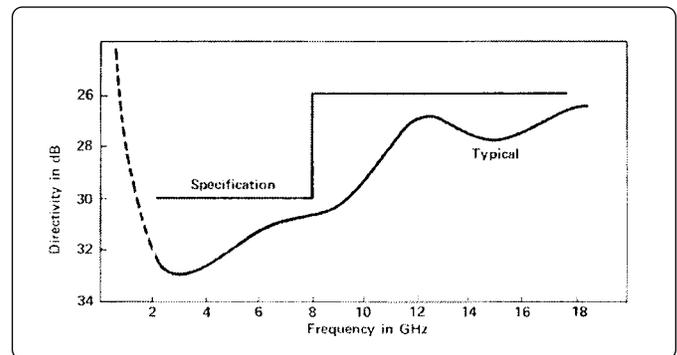


Figure 2. Directivity specifications.

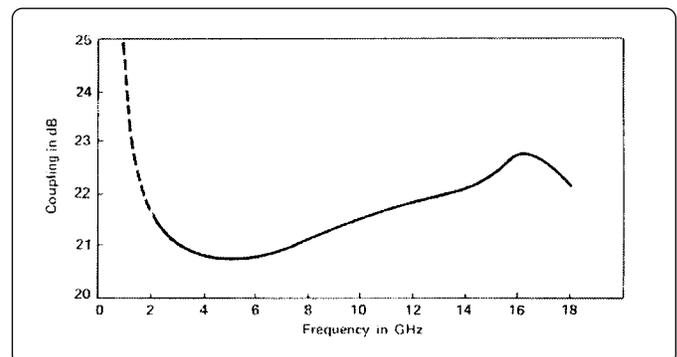


Figure 3. Typical coupling curve.

1. 24 dB with type-N connector on the INPUT PORT (11691D) or TEST PORT (11692D).  
2. Incident to test port.  
3. With the test port shorted and not including source match ripple.  
\* Typical tracking between 11691D and 11692D is ±0.07 dB.

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