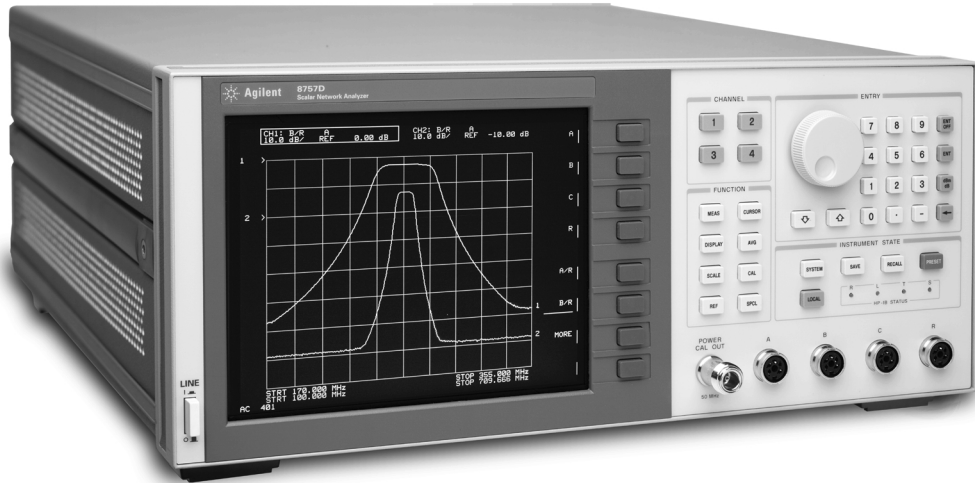


# Agilent 8757D Scalar Network Analyzers

10 MHz to 110 GHz

Configuration Guide



Agilent Technologies

Optimize your scalar analysis system to meet your specific measurement requirements. The Agilent 8757D measurement features provide greater system versatility and measurement throughout. This network analyzer forms the basis of a complete Agilent scalar measurement system. System components may be ordered separately, or as a complete package. The basic components of any scalar system include a scalar analyzer, a swept source, a directional bridge or coupler, and detectors. Other accessories such as a plotter, printer, or disk drive can be added to make a complete manual measurement system.

## **Agilent 8757D Scalar Network Analyzers**

### **Test set options**

- **8757D-700** standard test set
- **8757D-001** add fourth detector input
- **8757D-002** add internal power calibrator and a Type-N (m) to 3.5 (f) adapter
- **8757D-012** add fourth detector and internal power calibrator

### **Kit for rack flanges**

- **8757D-908** add rack flange kit for instruments without handles
- **8757D-913** add rack flange kit for instruments with handles

### **Documentation**

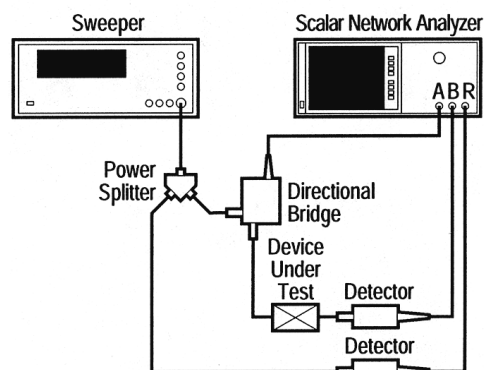
- **8757D-910** add extra manual set

**Service options are available**

## Coaxial System Configurations

The following configurations allow scalar network analyzer measurements in the indicated frequency ranges and connector types. Ratioing is recommended for all configurations, since it improves the effective source match by removing the effects of source power variations versus frequency. When ratio measurements are not desired, the power splitter and one detector may be removed from the system. See Figure 1 for a block diagram of a basic scalar measurement system.

Other adapters might be necessary if the connectors of the device under test do not mate with the test port connectors. The test port connectors are documented for each of the configured systems below. Adapter ordering information is provided in the ordering guide on page six.



**Figure 1. Basic scalar coaxial system, configured for ratio reflection and transmission measurements**

### Coaxial system configurations by frequency range and connector type

Frequency range	0.01 to 18 GHz	0.01 to 20 GHz	0.01 to 26.5 GHz	0.01 to 40 GHz	0.01 to 50 GHz
<b>Connector type</b>	Type-N	3.5 mm	3.5 mm	2.4 mm	2.4 mm
<b>Analyzer</b>	8757D	8757D	8757D	8757D	8757D
<b>Synthesized sweeper<sup>2</sup></b>	E8247C/57C with Options 520, 007, IED	E8247C/57C with Options 520, 007	E8247C/57C with Options 540, 007 2.4mm (f) to 3.5mm (m) adapter	E8247C/57C with Options 540, 007	83650B/L
<b>Synthesized sweeper</b> (discontinued in 2003)	83620B with Option C01, or 83752A with Option 1ED	83620B or 83752A	83630B/L	83640B/L	
<b>Detector</b> All have male connectors	85025A	85025E	85025E	85025D	85025D
<b>Directional bridge</b> Test port type Through adapter	85027C Type-N (f) N/A	85027E 3.5 mm (m) Included with bridge	85027E 3.5 mm (m) Included with bridge	85027D 2.4 mm (m) 11900B 2.4 mm (f) to (f)	85027D 2.4 mm (m) 11900B 2.4 mm (f) to (f)
<b>Power splitter<sup>1</sup></b>	11667A Option 001	11667B	11667B	11667C	11667C
<b>Adapter<sup>1</sup></b> (power splitter to bridge)	Included with bridge	Part No. 1250-1748 3.5 mm (m) to (m)	Part No. 1250-1748 3.5 mm (m) to (m)	11900A 2.4 mm (m) to (m)	11900A 2.4 mm (m) to (m)
<b>Reference detector<sup>1</sup></b>	85025A	85025E	85025E	85025D	85025D
<b>System cable kit</b>	85022A	85022A	85022A	85022A	85022A

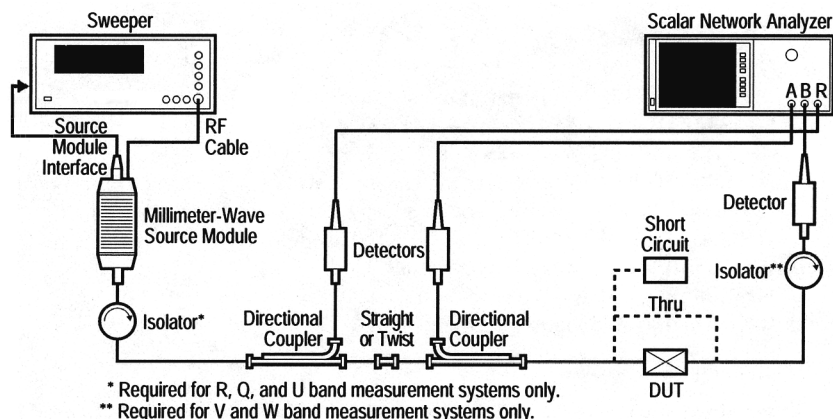
1. These accessories required for ratio measurements only.

2. For higher output power and dynamic range, add option IEA to the E8247C/57C PSG Signal Generator.

## Millimeter-wave System Configurations

Scalar measurements to 110 GHz are facilitated by the use of the Agilent 83550 series millimeter-wave source modules. When these modules are driven by an 11 to 20 GHz, >+17 dBm microwave source, such as the Agilent PSG (E8247C/57C) 83623B, 83624B, or any source in conjunction

with an Agilent 8349B amplifier, they provide waveguide frequency coverage to 110 GHz. These efficient frequency multipliers offer internally leveled, high output power, and the high frequency accuracy and resolution of the driving microwave source.



**Figure 2. Block diagram for millimeter-wave ratio transmission and reflection measurements**

## Millimeter-wave system configurations by frequency range and connector type

Frequency range	26.5 to 40 GHz	33 to 50 GHz	40 to 60 GHz	50 to 75 GHz	75 to 110 GHz
<b>Connector type</b>	WR-28 (R band)	WR-22 (Q band)	WR-19 (U band)	WR-15 (V band)	WR-10 (W band)
<b>Analyzer</b>	8757D	8757D	8757D	8757D	8757D
<b>Source</b>					
Synthesized sweeper	E8247C/57C Options 520, 007, IEA	E8247C/57C Options 520, 007, IEA	E8247C/57C Options 520, 007, IEA	E8247C/57C Options 520, 007, IEA	E8247C/57C Options 520, 007, IEA
Source module	83554A	83555A	83556A	83557A	83558A
<b>Detector</b> (need 3)	R85026A	Q85026A	U85026A	85025CK Option K57 and 85025C	85025CK Option K71 and 85025C
<b>Directional coupler</b> (need 2)	R band (R752C <sup>1</sup> )	Q band (Q752C <sup>1</sup> )	U band (U752C <sup>1</sup> )	V band (V752C <sup>1</sup> )	W band (W752C <sup>1</sup> )
<b>Isolator</b>	R band (R365A <sup>2</sup> )	Q band (Q365A <sup>2</sup> )	U band (U365A <sup>2</sup> )	V band (V365A <sup>2</sup> )	W band (W365A <sup>2</sup> )
<b>Fixed short</b>	Pan No. 11644-20005	Pan No. 11644-20004	Pan No. 11644-20004	Pan No. 11644-20015	Pan No. 11644-20015
<b>Support stand</b> (need 2)	Pan No. 85100-60010	Pan No. 85100-60010	Pan No. 85100-60010	Pan No. 85100-60010	Pan No. 85100-60010
<b>Straight or twist</b>	3rd party vendor	3rd party vendor	3rd party vendor	3rd party vendor	3rd party vendor
<b>System cable kit</b>	85022A	85022A	85022A	85022A	85022A

1. The Agilent x752C directional couplers have been discontinued as of 2002. However, they are still compatible with this configuration as well as other equivalent products.  
2. The Agilent x365A isolators have been discontinued as of 2002. However, they are still compatible with this configuration as well as other equivalent products.

## Basic Measurement System Components

### Sources

- **E8247C (Option 520, 007)** 250 kHz to 20 GHz synthesized sweeper
- **E8247C (Option 540, 007)** 250 kHz to 40 GHz synthesized sweeper
- **E8257C (Option 520, 007)** 250 kHz to 20 GHz synthesized sweeper with analog and pulse modulation
- **E8257C (Option 540, 007)** 250 kHz to 40 GHz synthesized sweeper with analog and pulse modulation
- **83650B** 0.01 to 50 GHz synthesized sweeper

(for high output add option IEA)

Extended service options available.

### Amplifiers

- **8347A** 100 kHz to 3 GHz RF amplifier
- **8348A** 2 to 26.5 GHz microwave amplifier
- **8349B** 2 to 20 GHz microwave amplifier

### Directional bridges<sup>1</sup>

The following operate in AC or DC detection modes.

- **85027A** 0.01 to 18 GHz, 7 mm
- **85027B** 0.01 to 26.5 GHz, 3.5 mm (f)
- **85027C** 0.01 to 18 GHz, Type-N (f)
- **85027D** 0.01 to 50 GHz, 2.4 mm (m)
- **85027E** 0.01 to 26.5 GHz, 3.5 mm (m)

### Precision detectors (For use with the 8757D only)

- **85037A** 0.01 to 18 GHz, type-N (m)  
**85037A-001** 7-mm connector  
(A Type-N (m) to 7-mm adapter is included to calibrate the 85037A-001 precision detector via the 8757D-002 internal power calibrator.)
- **85037B** 0.01 to 26.5 GHz, 3.5 mm (m)

### Detectors

- **85025A** 0.01 to 18 GHz, Type-N (m)  
**85037A-001** 7-mm connector
- **85025B** 0.01 to 26.5 GHz, 3.5 mm (m)
- **85025D** 0.01 to 50 GHz, 2.4 mm (m)
- **85025E** 0.01 to 26.5 GHz, 3.5 mm (m) with improved return loss

### Detector adapters

- **85025C** SMA (m), AC or DC detection

### Power splitters<sup>1</sup>

- **11667A** DC to 18 GHz, all connectors Type-N (f)  
**1167A-001** Type-N (m) input connector  
**1167A-002** 7-mm output connectors
- **11667B** DC to 26.5 GHz, 3.5 mm (f)
- **11667C** DC to 50 GHz, 2.4 mm (f)

### Power dividers<sup>1</sup>

- **11636A** DC to 18 GHz, Type-N (f)
- **11636B** DC to 26.5 GHz, 3.5 mm (f)

## Basic Millimeter-Wave System Components

### Millimeter-wave modules

- **83554A** 26.5 to 40 GHz, WR-28 waveguide
- **83555A** 33 to 50 GHz, WR-22 waveguide
- **83556A** 40 to 60 GHz, WR-19 waveguide
- **83557A** 50 to 75 GHz, WR-15 waveguide
- **83558A** 75 to 110 GHz, WR-10 waveguide

### Waveguide detectors

- **R85026A** 26.5 to 40 GHz, WR-28
- **Q85026A** 33 to 50 GHz, WR-22
- **U85026A** 40 to 60 GHz, WR-19
- **85025CK-K57** 50 to 75 GHz, WR-15, must order with 85025C
- **85025CK-K71** 75 to 110 GHz, WR-10, must order with 85025C

### Waveguide directional couplers

- **R752A/C/D** 26.5 to 40 GHz, 3/10/20 dB, WR-28
- **Q752A/C/D** 33 to 50 GHz, 3/10/20 dB, WR-22
- **U752A/C/D** 40 to 60 GHz, 3/10/20 dB, WR-19
- **V752C/D** 50 to 75 GHz, 10/20 dB, WR-15
- **W752C/D** 75 to 110 GHz, 10/20 dB, WR-10

### Waveguide accessories

- **R365A** waveguide isolator, WR-28
- **Q365A** waveguide isolator, WR-22
- **U365A** waveguide isolator, WR-19
- **V365A** waveguide isolator, WR-15
- **W365A** waveguide isolator, WR-10
- **R910A** fixed load, WR-28
- **Q910A** fixed load, WR-22
- **V910C** fixed load, WR-15
- **W910C** fixed load, WR-10
- **Part No. 11644-20015** V/W fixed short, WR-15/10
- **Part No. 85100-60010** waveguide support stand
- **Part No. 85043-80013** anti-static mat
- **Part No. 11644-20004** Q/U fixed short, WR-22/19
- **Part No. 11644-20005** R fixed short, WR-28

1. Connector types refer to the test port (or output) connector unless otherwise specified.

## Other Measurement Accessories

### Standards

- **909A** 50 ohm termination, 7 mm
  - **Option 012** 50 ohm termination, Type-N (m)
- **909D** 50 ohm termination, 3.5 mm (m)
  - **Option 011** 50 ohm termination, 3.5 mm (f)
- **8490D** Option 010 50 ohm 10 dB pad, 2.4 mm (m)
- **8491B** Option 010 50 ohm 10 dB pad, Type-N (m)
- **8492A** Option 010 50 ohm 10 dB pad, 7 mm
- **8493C** Option 010 50 ohm 10 dB pad, 3.5 mm (m)
- **11512A** 50 ohm short, Type-N (m)
- **85138A** 50 ohm termination, 2.4 mm (m)
- **85138B** 50 ohm termination, 2.4 mm
- **85140A** short, 2.4 mm (m)
- **85141A** open, 2.4 mm (m)
- **85141B** open, 2.4 mm (f)
- **Part No. 1250-1530** 75 ohm short, Type-N (m)
- **Part No. 1250-1532** 75 ohm termination, Type-N (m)
- **Part No. 85021-60001** open/short, 7 mm
- **Part No. 85027-60004** open/short, 3.5 mm (f)
- **Part No. 85032-60001** 50 ohm open, Type-N (m)
- **Part No. 85037-60001** open/short, 3.5 mm (m)

### Other accessories

- **11613B** calibrator
- **11679A** 7.6 m (25 ft) extension cable
- **11679B** 61 m (200 ft) extension cable
- **11852B** 50/75 ohm minimum loss pad
- **85022A** system cable kit
- **Disk drive** Agilent no longer offers Option 802, the 9122C disk drive. 8757D/E compatible disk drives are available from ISA, Inc. In the U.S., contact Saaya, Inc. (formerly known as ISA, Inc.). Elsewhere, contact ISA Company, Ltd at [www.isa-j.co.jp/](http://www.isa-j.co.jp/)

### Adapters

- **R281A** 2.4 mm (f) to WR-28
- **R281B** 2.4 mm (m) to WR-28
- **Q281A** 2.4 mm (f) to WR-22
- **Q281B** 2.4 mm (m) to WR-22
- **11900A** 2.4 mm (m) to (m)
- **11900B** 2.4 mm (f) to (f)
- **11900C** 2.4 mm (m) to (f)
- **Part No. 1250-1745** Type-N (m) to (m)
- **Part No. 1250-1743** 3.5 mm (m) to Type-N (m)
- **Part No. 1250-1746** 7 mm to 3.5 mm (m)
- **Part No. 1250-1747** 7 mm to 3.5 mm

### *Directional bridge connector savers*

- **Part No. 85027-60002** 3.5 mm (m) to (m)  
*(For use with the 85027B directional bridge only)*
- **Part No. 85027-60003** 3.5 mm (m) to (f)  
*(For use with the 85027B directional bridge only)*
- **Part No. 85027-60005** 3.5 mm (f) to (f)
- **Part No. 85027-60006** 3.5 mm (f) to (m)
- **Part No. 85027-60007** 3.5 mm (m) to (m)

### Peripherals

For a list of compatible printers, consult our printer-compatibility guide Web page. Its URL location is [www.agilent.com/find/pcg](http://www.agilent.com/find/pcg)

## Software and Upgrade Kits

### Software

(BASIC and 2 Mbytes of memory are required for use.)

- **Part No. 86399-10001** amplifier test software

### Upgrade kits

- **Hardware upgrades**

**86383C** 8757D upgrade kit<sup>1</sup>

(order one or both of the following options)

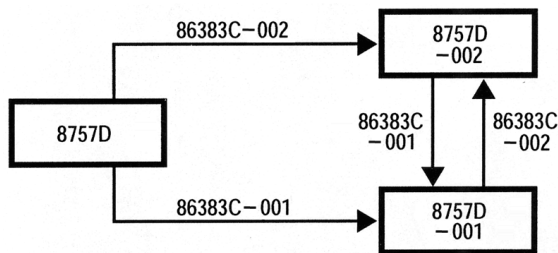
- **86383C-001** modifies 8757D to include 8757D-001 (fourth detector input)
- **86383C-002** modifies 8757D to include 8757D-002 (internal power calibrator)

- **Firmware upgrades**

**Part No. 08757-60098** 8757E firmware kit

**Part No. 08757-60099** 8757C firmware kit

**Part No. 08757-60129** 8757D firmware kit



## Literature Guide

- *Agilent 8757D/E scalar network analyzers*, Data Sheet, publication number 5091-2471E
- *Improving network analyzer measurements of frequency-translating devices*, Application Note 1287-7, publication number 5966-3318E
- *Network analyzer measurements: filter and amplifier examples*, Application Note 1287-4, publication number 5965-7710E
- *Microwave component measurements; amplifier measurements using the scalar network analyzer*, Product Note 345-1, publication number 5954-1599
- *Improving scalar network analysis using the PSG signal generator and the 8757D scalar network analyzer*, Application Note 1435, publication number 5988-8432EN

1. Installation not included.

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© Agilent Technologies, Inc. 2002, 2003  
Printed in USA, February 12, 2003  
5967-6177E



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