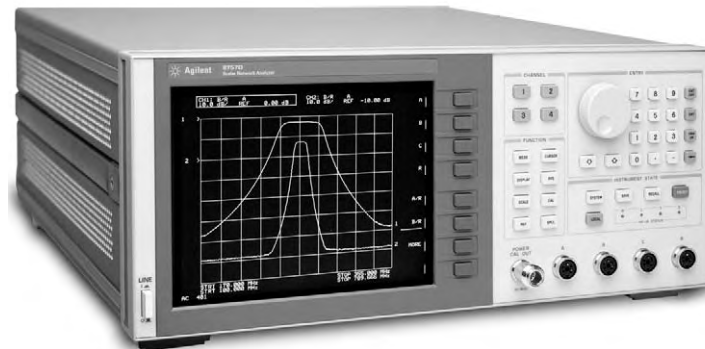


Agilent 8757D Scalar Network Analyzer

Data Sheet



Accurate measurement of transmission and reflection characteristics is a key requirement in your selection of a scalar network analyzer. To help you achieve these goals, Agilent Technologies offers you a choice of microwave scalar measurement solutions which provide an excellent balance of cost, system versatility, and measurement precision.

Agilent 8757D overview of features

- Four display channels
- Three detector inputs
- An optional fourth detector input
- An optional internal power calibrator
- Accurate power measurements with Agilent 85037 series precision detectors
- High resolution color display
- Internal plotter/printer buffer
- +16 to -60 dBm dynamic range
- AC/DC detection modes
- 101 to 1601 measurement points/trace
- Noise figure measurement display capability
- Compatible with the Agilent 85025 and 85026 series detectors and the Agilent 85027 series directional bridges
- Limit line testing (channels 1 and 2)
- Adaptive normalization
- Cursor search functions (max, min, n dB, BW)

Specifications describe the instrument's warranted performance over the temperature range 0 to 55 °C (except where noted). Supplemental characteristics are intended to provide information useful in applying the instrument, by giving typical but non-warranted performance parameters. These are denoted as "typical," "nominal," or "approximate."



Agilent Technologies

Agilent 8757D scalar network analyzer

The Agilent 8757D has four independent display channels that process the signals from the Agilent 85037 series precision detectors, 85025 and 85026 detectors, and the 85027 series directional bridges for logarithmic display, in single channel or ratio mode. Three (optionally four) detector inputs are provided.

Display

Horizontal resolution

The number of points (horizontal resolution) that can be selected depends on the number of traces displayed.

Network analyzer	Traces	Selectable number of points
8757D	1	101, 201, 401, 801, 1601
	2	101, 201, 401, 801
	3, 4	101, 201, 401

LCD Display 640 (horizontal) x 480 (vertical) resolution

A display is considered faulty if:

- A complete row or column of “stuck” or “dark” pixels.
- More than six “stuck on” pixels (but not more than three green) or more than 0.002% of the total pixels are within the LCD specifications.
- More than twelve “dark” pixels (but no more than seven of the same color) or more than 0.004% of the total pixels are within the LCD specifications.
- Two or more consecutive “stuck on” pixels or three or more consecutive “dark” pixel (but no more than one set of two consecutive dark pixels) “Stuck on” or “dark” pixels less than 6.5 mm apart (excluding consecutive pixels)

Display modes

All analyzer display channels can display any one of the detector inputs or any ratio combination of detector inputs.

Log magnitude

dBm: single channel power measurement

dB: relative power measurement (ratio or relative to trace memory)

SWR

Relative measurements (normalized or ratio measurements) can be displayed in SWR.

Channels 1 and 2 only: 401 points or fewer

AUX voltage

The rear panel BNC input ADC IN can be measured and displayed in volts (-10 to +10 volts).

Typical maximum error is 60 mV.

Color settings

Up to 8 operator-selectable colors are available for LCD attributes, such as the grid, measurement traces, and labels.

Sweep time

The minimum sweep time depends on the number of traces displayed and the number of points selected.

Number of points	Minimum sweep time (ms) (log magnitude format)			
	1 trace	2 traces	3 traces	4 traces
101	40	50	60	70
201	50	75	90	100
401	100	100	150	200
801	200	250		
1601	400	NA	NA	NA

Averaging

2, 4, 8, 16, 32, 64, 128, or 256 successive traces can be averaged.

Smoothing

Provides a linear moving average of adjacent data points. The smoothing aperture defines the trace width (number of data points) to be averaged, and ranges from 0.1% to 20% of the trace width.

Normalization

Traces are stored and normalized with the highest resolution, independent of display scale/division or offset. With adaptive normalization on the Agilent 8757D, calibration data is interpolated when the frequency span is decreased.

Limit lines

Limit lines facilitate quick pass/fail decisions.

Limits can be any combination of flat or sloped lines or single points up to 12 segments. They are only available for channels 1 and 2, for traces with 401 points or fewer, and can be stored in save/recall registers 1 through 4.

Internal save/recall registers

Up to 9 complete front panel states may be saved or recalled. If the source (Agilent PSG, 8360 or 8370 series) is connected to the 8757 system interface, the front panel states of both the network analyzer and source are saved. Registers 1 through 4 store the instrument state and the memory traces for channels 1 and 2. The memory traces for channels 3 and 4 are not stored. Registers 5 through 9 only store the instrument state.

Display mode	Scale resolution	Display range	Vertical resolution
dBm	0.1 to 20 dB/div (1/2/5 sequence)	-80 to +80 dBm	0.003 dB ¹
dB	0.1 to 20 dB/div (1/2/5 sequence)	-90 to +90 dB	0.006 dB ¹
Normalized ratio measurements	0.1 to 20 dB/div (1/2/5 sequence)	-180 to +180 dB	0.01 dB
SWR	0.02 to 10 units/div (1/2/4 sequence)	1.0 to 37.0	0.01 at 1 0.1 at 10 0.27 at 30
AUX voltage	0.025 to 5 V/div (1/2.5/5 sequence)	-10 to +10 V	0.001 V

1. 0.01 dB for display cursor

Modulation requirements

Applies to the Agilent 85037 series precision detectors, 85025/26 series detectors, and 85027 series directional bridges in AC mode.

Square-wave amplitude modulation

Frequency 27,778 Hz \pm 20 Hz
 \geq 30 dB on/off ratio
45% to 55% symmetry

Rear panel connectors

Sweep voltage requirements (Sweep in)

Horizontal sweep voltage, normally provided by the sweeper, from 0 to 10 volts.

Marker and blanking requirements (Pos z blank)

Blanking and marker signals are provided by the sweeper through the "Pos z blank" input on the rear panel of the Agilent 8757.

Voltage levels

Blanked: +5 V typical
Unblanked: 0 V typical
Marker: -4 V typical
Active marker: -8 V typical

Modulator drive

The modulator drive output of the 8757 scalar analyzer provides the circuitry to drive the 8340/50/60/70 series synthesized sweepers and the Agilent 11665B modulator. Modulation drive may be turned on and off via the front panel or GPIB. In the "off" state, the modulator drive signal turns the 11665B fully on for minimum insertion loss. The 8360 and 8370 synthesized sweepers have the capability of modulating signals, so an external modulator such as the 11665B is not necessary when using the 8360/70 series.

Frequency: 27,778 Hz \pm 12 Hz

Symmetry: 50% \pm 1%

Stop sweep

Used with the PSG, 8360 and 8370 series when controlled by the 8757 system interface to stop the sweep at band crossings and at the end of sweep.

ADC in

An input connector for auxiliary voltage input in the -10 to +10 volt range. This voltage can be displayed (in volts) on any channel.

Control 1 and control 2

These connectors provide digital output signals (TTL open-collector) as a user convenience for driving other peripheral equipment in a GPIB controlled system.

Video outputs

Used to drive an external color monitor that has the following characteristics:

8757D with LCD monitor (VGA input on the analyzer's rear panel)

- VGA compatible

8757D with CRT monitor (RGB inputs on the analyzer's rear panel)

- Red, green, and blue (RGB) BNC inputs, sync on green
- 75 ohm input impedance
- 26.5 kHz horizontal scan rate
- 60 Hz vertical refresh rate
- 1 V p-p (typically 0.7 V = white; 0 V = black; -0.3 V = sync)

Agilent 8757D scalar network analyzer, continued

GPIB

Interface

GPIB operates according to IEEE 488-1978 and IEC-625 interface standards.

Interface function codes

SH1, AH1, T6, TE0, L4, LE0, SR1, RL1, PP0, DC1, DT0, C0, E1.

Transfer formats

Data can be transferred either as ASCII strings or as 16-bit integers. Readings may be taken at a single point, or an entire trace may be transferred at once.

Transfer speed

ASCII format, 401 point trace: 500 ms typical
ASCII format, single point: 10 ms typical
Binary format, 401 point trace: 30 ms typical
Binary format, single point: 7 ms typical

Programmable functions

All front panel functions except power on/off are programmable. The 8757D is compatible with all appropriate 8757A/C scalar analyzer programming codes.

User-accessible display graphics

HPGL subset that allows user to display test setup diagrams and operator instructions on the analyzer CRT/LCD.

Interrupts

GPIB service interrupts (SRQs) are generated for the following conditions:

- Front-panel key pressed
- Operation complete
- Illegal command
- Instrument self-test error
- Limit test failed

System interface

The Agilent 8757 system interface is a dedicated GPIB port used exclusively by the 8757 to control and extract information from a swept source, a digital plotter, and a printer.

Compatible swept sources

The following swept sources are specifically made to complement the 8757 system. With them, the 8757 is able to display start, stop, and marker frequencies, save and recall front panel states of both the sweeper and the scalar analyzer, preset both instruments simultaneously, and alternately sweep two different frequency or power ranges and display both simultaneously:

- Agilent PSG¹ signal generators (Option 007)
- Agilent 8360 series synthesized sweeper
- Agilent 8370 series synthesized sweeper

Printers

For a list of compatible printers, consult our printer-compatibility guide Web page. Its URL location is <http://www.agilent.com/find/pcg>. Or go to www.agilent.com and use keyword search *printer guide*.

Internal plotter/printer buffer

The GPIB buffer speeds measurements by returning the control to the analyzer while outputting data to a plotter or printer. Output two channels (401 points each) of information to the buffer in typically less than 5 seconds.

Note: In order to use the currently available printers a GP-IB to parallel port adapter is needed. Adapters are available from Intelligent Interfaces. Please see their website at <http://www.intelligentinterfaces.com>.

Disk interface

The 8757D provides the capability to store and retrieve the analyzer's instrument state, measurement data, and user accessible display graphics to and from an external GPIB disk drive that is compatible with command subset CS/80. Data files are stored in Agilent's standard LIF format and can be read by a wide variety of computers, including the HP 9000 series 200 or 300. Files can be stored in binary or ASCII format.

Disk drive

Agilent no longer offers Option 802, the HP 9122C disk drive. Agilent 8757D-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 <http://www.isa-j.co.jp/>.

¹ URL location: <http://www.agilent.com/find/psg>

General information

Temperature range

Operating: 0 to 55 °C

Storage: -40 to 75 °C

Power requirements

48 to 66 Hz, 100/120/220/240 V ±10%,
typically 155 VA

Dimensions: 178 H x 425 W x 482 mm D
(7.0 x 16.75 x 19.0 in)

Weight: Net 22 kg (48 lb), Shipping: 28 kg (61.5 lb)

Power calibrator (Option 002 only)

The 8757D's internal power calibrator provides a 50 MHz reference standard for characterizing the absolute power accuracy and dynamic power accuracy of the 85037 series precision detectors.

Frequency: 50 MHz ±0.2 MHz

Output power: (25 ±5 °C)

Range: +20 to -50 dBm

Accuracy at 0 dBm: ±0.05 dB

Linearity: (over any 10 dB range)

±0.08 dB (+20 to +10 dBm)

±0.04 dB (+10 to -30 dBm)

±0.06 dB (-30 to -50 dBm)

SWR: ≤1.05

Modes of operation

DC Mode (unmodulated)

AC Mode (modulated at 27,778 Hz ±12 Hz)

Connector: Type-N (f)

Accessory included

A Type-N (m) to 3.5-mm (f) adapter is provided to allow calibration of the 85037B (3.5 mm) precision detector.

Ordering information

Agilent 8757D scalar network analyzer (select one)

8757D-700 Standard network analyzer

8757D-001 Adds fourth detector input

8757D-002 Adds internal power calibrator

8757D-012 Adds fourth detector and internal calibrator

System accuracy

Transmission measurement accuracy

Transmission loss or gain measurements are made relative to a 0 dB reference point established at calibration.

Transmission measurement uncertainty =
dynamic power accuracy + mismatch uncertainty

Dynamic power accuracy is the measurement uncertainty due to the change in power level between calibration and the measurement. Mismatch uncertainty is the uncertainty due to reflections in the measurement setup. The frequency response errors of the source, detectors, bridge, and power splitter are removed via calibration.

Transmission measurement uncertainty examples

Assumptions:

- Measurement frequency = 10 GHz
- DUT input/output SWR = 1.5
- Ratio measurement

Change in power after calibration
<30 dB (+0 to -30 dBm range)

Uncertainty component	85037B precision detector	85025E detector
Dynamic accuracy (±dB)	0.11	0.40
Mismatch (±dB)	0.45	0.33
Total (±dB)	0.56	0.73

Change in power after calibration
60 dB (+6 to -55 dBm range)

Uncertainty component	85037B precision detector	85025E detector
Dynamic accuracy (±dB)	0.96	2.00
Mismatch (±dB)	0.45	0.33
Total (±dB)	1.41	2.33

Absolute power measurement accuracy

This specification is useful for determining the accuracy of power measurements in dBm when using the Agilent 85037 series precision detectors or the 85025 series detectors in DC mode.

Absolute power uncertainty =
absolute power accuracy at 50 MHz + frequency response + mismatch uncertainty

Absolute power measurement uncertainty examples

Assumptions:

- Measurement frequency = 10 GHz
- DUT input/output SWR = 1.5

Power = +10 dBm

Uncertainty component	85037B precision detector	85025E detector
Absolute power accuracy at 50 MHz (±dB)	0.11	0.50
Frequency response (±dB)	0.18	0.50
Mismatch (±dB)	0.18	0.10
Total (±dB)	0.47	1.10

Power = 0 dBm

Uncertainty component	85037B precision detector	85025E detector
Absolute power accuracy at 50 MHz (±dB)	0.11	0.40
Frequency response (±dB)	0.18	0.50
Mismatch (±dB)	0.18	0.10
Total (±dB)	0.47	1.00

Power = 50 dBm

Uncertainty component	85037B precision detector	85025E detector
Absolute power accuracy at 50 MHz (±dB)	0.85	1.30
Frequency response (±dB)	0.18	0.50
Mismatch (±dB)	0.18	0.10
Total (±dB)	1.21	1.90

Precision detector vs. power sensor absolute power measurement accuracy

Accuracy terms differ depending on the test equipment used to make absolute power measurements. The following table simplifies and compares the accuracy terms of an Agilent 8757 system (using an 85037 series precision detector) and a power meter (using a power sensor). A measurement accuracy example is also provided.

Scalar terms	Equivalent power meter/sensor terms
Absolute power accuracy at 50 MHz	Power reference uncertainty Instrument linearity Zero set Noise
Frequency response	Sensor calibration factor uncertainty
Mismatch	Mismatch

Scalar analyzer vs. power meter

Absolute power measurement uncertainty examples

Assumptions:

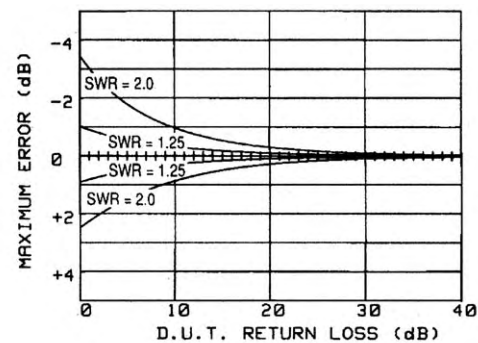
- Measurement frequency = 10 GHz
- DUT input/output SWR = 1.5
- Power measurement range = +10 to -20 dBm

Uncertainty component (see above table for equivalent power meter terms)	8757D Opt. 002/ 85037B	EPM-4418B 8485A
Absolute power accuracy at 50 MHz (\pm dB)	0.11	0.09
Frequency response (\pm dB)	0.18	0.09
Mismatch (\pm dB)	0.18	0.12
Total (\pm dB)	0.47	0.30

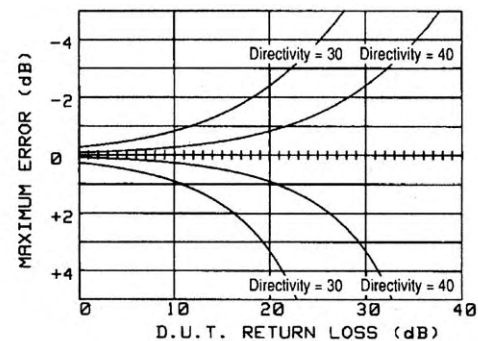
Reflection measurement accuracy

Uncertainties due to calibration error and the frequency response of the source, detectors, and bridges are removed via open/short averaging. The remaining uncertainties are primarily the sum of directivity uncertainty, effective source match uncertainty, and dynamic power accuracy. As shown in the graphs below, directivity is the dominant error term when measuring small reflected signals (high return loss) and source match is dominant when measuring large reflected signals (low return loss).

Effective source match vs. reflection uncertainty



Directivity vs. reflection uncertainty



Example calculation

The following example shows how to find the uncertainty (excluding dynamic accuracy) in measuring a 14-dB return loss (SWR = 1.5) with an 85027A directional bridge at 10 GHz (directivity = 40 dB, test port match = 1.25 SWR).

Uncertainty component	Uncertainty
Source match error	approximately \pm 0.2 dB
Directivity error	approximately \pm 0.4 dB
Total uncertainty	approximately \pm 0.6 dB

System accessories

Detectors

Agilent 85037 series precision detectors (AC/DC)

The 85037 series precision detectors are designed specifically for operation with the Agilent 8757D scalar network analyzer and are not compatible with the 8757A/E, 8756, or 8755 scalar network analyzers. These detectors may be used in either AC or DC detection modes. For improved power measurement accuracy versus frequency, each 85037 series precision detector includes detector specific frequency response data, stored in an internal EEPROM, which is automatically read by the 8757D. When used in conjunction with the 8757D's internal power calibrator (Option 002), these detectors provide the maximum absolute power measurement accuracy.



Precision Detector Summary, Agilent 85037 Series¹ For use with the 8757D in either AC or DC detection modes

Model	Frequency range	Connector type	Dynamic range	Frequency	Return loss	Frequency response ³
85037A	10 MHz to 18 GHz	Type-N (m) 7 mm ²	AC mode +20 to -55 dBm	0.01 to 0.04 GHz	10 dB	±0.35 dB
			DC mode +20 to -50 dBm	0.04 to 18 GHz	20 dB	±0.18 dB
85037B	10 MHz to 26.5 GHz	3.5 mm (m)	AC mode +20 to -55 dBm	0.01 to 0.04 GHz	10 dB	±0.35 dB
			DC mode +20 to -50 dBm	0.04 to 18 GHz	20 dB	±0.18 dB
				18 to 26.5 GHz	18 dB	±0.22 dB

Model	Power (50 MHz)	Dynamic accuracy ^{4,5}		Absolute accuracy ^{4,6}	
		Corrected	Default	Corrected	Default
85037A/B	20 dBm	±0.25 dB	±0.40 dB	±0.25 dB	±0.40 dB
	10 dBm	±0.11 dB	±0.40 dB	±0.11 dB	±0.40 dB
	-30 dBm	±0.11 dB	±0.40 dB	±0.11 dB	±0.40 dB
	-40 dBm	±0.40 dB	±0.80 dB	±0.40 dB	±0.80 dB
	-50 dBm	±0.85 dB	±1.30 dB	±0.85 dB	±1.30 dB
	-55 dBm	±0.85 dB	±1.30 dB	—	—

Temperature coefficient of linearity: 0.01 dB/°C temperature change after calibration

1. The 85037A/B specifications are only applicable when used with the 8757D scalar network analyzer.
2. Option 001 changes to 7 mm connector.
3. -10 dBm, 25 ±5 °C

Agilent 85025 and 85026 series detectors (AC/DC)

The 85025 and 85026 series detectors are designed specifically for operation with the Agilent 8757 scalar network analyzer and are not compatible with either the 8756 or the 8755. The 85025/26 detectors may be used in either AC or DC detection modes.

General information—coaxial detectors

Impedance: 50 ohms nominal

Maximum input power: +20 dBm (100 mW)

Maximum input voltage: 10 VDC

Dimensions: Cable length is 1.22 m (48 in.)

Weight: Net 0.24 kg (0.5 lb), Shipping 1.0 kg (2.2 lb)

Detector adapters

The Agilent 85025C detector adapters match the scalar analyzer display to most standard crystal, silicon, and gallium arsenide detectors. This enables the user to operate up to 110 GHz with the Agilent 8757. The 85025C detector adapters are designed for use with the 8757 only, and can operate in either AC or DC detection modes.

Maximum measurable input: ±3 V peak

Maximum allowable input: ±10 V peak

Connector: SMA (m)

4. The corrected specifications apply after a calibration via the 8757D-002 internal power calibrator. The default specifications apply when the calibrator is not used. Power calibrator uncertainty is included in the 85037A/B corrected specifications.
5. Dynamic accuracy refers to measurement accuracy as power varies (in dB) from a 0 dBm reference. 25 ±5 °C. 50 MHz, calibration and measurement at the same temperature.
6. DC mode. 25 ±5 °C, calibration and measurement at the same temperature.

Coaxial Detector Summary, Agilent 85025 Series
For use with the 8757 in either AC or DC detection modes

Model	Frequency range	Connector type	Dynamic range	Frequency	Return loss	Frequency response ²	Power (50 MHz)	Dynamic accuracy ³	Absolute accuracy ⁴	
85025A ⁵	10 MHz to 18 GHz	Type-N (m)	AC mode	0.01 to 0.04 GHz	10 dB	±0.8 dB	16 dBm	±0.8 dB	±0.8 dB	
			+16 to -55 dBm	0.04 to 4 GHz	20 dB	±0.5 dB	6 dBm	±0.4 dB	±0.4 dB	
		7 mm ¹	DC mode	4 to 18 GHz	17 dB	±0.5 dB	-35 dBm	±0.4 dB	±0.4 dB	
			+16 to -50 dBm				-50 dBm	±1.3 dB	±1.3 dB	
						-55 dBm	±1.6 dB			
85025B ⁵	10 MHz to 26.5 GHz	3.5 mm (m)	AC mode	0.01 to 0.04 GHz	10 dB	±0.8 dB	16 dBm	±0.8 dB	±0.8 dB	
			+16 to -55 dBm	0.04 to 4 GHz	20 dB	±0.5 dB	6 dBm	±0.4 dB	±0.4 dB	
			DC mode	4 to 18 GHz	17 dB	±0.5 dB	-35 dBm	±0.4 dB	±0.4 dB	
			+16 to -50 dBm	18 to 26.5 GHz	12 dB	±2.0 dB	-50 dBm	±1.3 dB	±1.3 dB	
						-55 dBm	±1.6 dB			
85025D ⁵	10 MHz to 50 GHz	2.4 mm (m)	AC mode	0.01 to 0.1 GHz	10 dB	±0.8 dB	16 dBm	±1.0 dB	±1.0 dB	
			+16 to -55 dBm	0.1 to 20 GHz	20 dB	±0.5 dB	6 dBm	±0.4 dB	±0.4 dB	
			DC mode	20 to 26.5 GHz	20 dB	±1.0 dB	-35 dBm	±0.4 dB	±0.4 dB	
			+16 to -50 dBm	26.5 to 40 GHz	15 dB	±2.5 dB	-50 dBm	±1.3 dB	±1.3 dB	
						40 to 50 GHz	9 dB	±3.0 dB	-55 dBm	±1.6 dB
85025E ⁵	10 MHz to 26.5 GHz	3.5 mm (m)	AC mode	0.01 to 0.1 GHz	10 dB	±0.8 dB	16 dBm	±1.0 dB	±1.0 dB	
			+16 to -55 dBm	0.1 to 18 GHz	25 dB	±0.5 dB	6 dBm	±0.4 dB	±0.4 dB	
			DC mode	18 to 25 GHz	25 dB	±0.5 dB	-35 dBm	±0.4 dB	±0.4 dB	
			+16 to -50 dBm	25 to 26.5 GHz	23 dB	±1.4 dB	-50 dBm	±1.3 dB	±1.3 dB	
						-55 dBm	±1.6 dB			

Waveguide Detectors and Detector Adapters Summary
For use with the 8757 only in either AC or DC detection modes

Model	Frequency range	Connector type	Dynamic range	Return loss	Frequency response	Dynamic accuracy
R85026A ⁵	26.5 to 40 GHz	WR-28	+10 to -50 dBm (AC mode) +10 to -45 dBm (DC mode)	12 dB	±1.5 dB	±(0.3 dB + 0.03 dB/dB)
Q85026A ⁵	33 to 50 GHz	WR-22	+10 to -50 dBm (AC mode) +10 to -45 dBm (DC mode)	12 dB	±2.0 dB	±(0.3 dB + 0.03 dB/dB)
U85026A ⁵	40 to 60 GHz	WR-19	+10 to -50 dBm (AC mode) +10 to -45 dBm (DC mode)	12 dB	±2.0 dB	±(0.3 dB + 0.03 dB/dB)
85025CK-K57 ⁷	50 to 75 GHz	WR-15	+10 to -45 dBm (typical)	9.5 dB (typical)		
85025CK-K71 ⁷	75 to 110 GHz	WR-10	+10 to -45 dBm (typical)	9.5 dB (typical)		
85025C ⁵	⁶	SMA (m)	⁶	⁶	⁶	⁶

1. Option 001 changes to 7 mm connector.
2. -10 dBm, 25 ±5 °C
3. Dynamic accuracy refers to measurement accuracy as power varies (in dB) from a 0 dBm reference. 25 ±5 °C, 50 MHz.
4. DC mode, 25 ±5 °C.

5. The 85025 and 85026 series detectors and the 85025C detector adapter require 8757A firmware revision 2.0 or higher.
6. Depends on the detector.
7. Must be used with the 85025C detector adapter.

System accessories, continued

Directional bridges

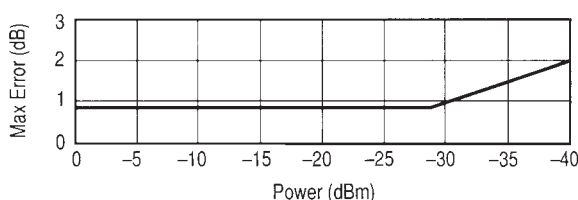
Agilent 85027 series directional bridges (AC/DC)

The 85027 series directional bridges are designed to operate with either the 8757 in AC or DC detection modes or with the 8756 or 8755 in AC detection mode. These bridges offer high directivity, excellent test port match, and a measurement range of up to 50 GHz in coax.

General information—directional bridges

Dynamic power accuracy

(50 MHz, 25 ±5 °C, +7 dBm input)



Directional Bridge Summary

For use with the 8757 in AC or DC detection mode or with the 8756 or 8755 in AC detection mode only

Model	Frequency range	Nominal impedance	Input connector	Test port connector	Frequency	Directivity	Frequency	Test port match
85027A	10 MHz to 18 GHz	50 ohms	Type-N (f)	7 mm	0.01 to 18 GHz	40 dB	0.01 to 8.4 GHz	<1.15 SWR
							8.4 to 12.4 GHz	<1.25 SWR
							12.4 to 18 GHz	<1.43 SWR
85027B	10 MHz to 26.5 GHz	50 ohms	3.5 mm (f)	3.5 mm (f)	0.01 to 20 GHz 20 to 26.5 GHz	40 dB 36 dB	0.01 to 8.4 GHz	<1.15 SWR
							8.4 to 20 GHz	<1.43 SWR
							20 to 26.5 GHz	<1.78 SWR
85027C	10 MHz to 18 GHz	50 ohms	Type-N (f)	Type-N (f)	0.01 to 12.4 GHz 12.4 to 18 GHz	36 dB 34 dB	0.01 to 8.4 GHz	<1.15 SWR
							8.4 to 12.4 GHz	<1.25 SWR
							12.4 to 18 GHz	<1.43 SWR
85027D	10 MHz to 50 GHz	50 ohms	2.4 mm (f)	2.4 mm (m)	0.01 to 26.5 GHz 26.5 to 40 GHz 40 to 50 GHz	35 dB 30 dB 25 dB	0.01 to 16 GHz	<1.18 SWR
							16 to 30 GHz	<1.27 SWR
							30 to 40 GHz	<1.40 SWR
							40 to 50 GHz (typical)	<1.85 SWR
85027E	10 MHz to 26.5 GHz	50 ohms	3.5 mm (f)	3.5 mm (m)	0.01 to 20 GHz 20 to 26.5 GHz	40 dB 36 dB	0.01 to 8.4 GHz	<1.15 SWR
							8.4 to 20 GHz	<1.43 SWR
							20 to 26.5 GHz	<1.78 SWR

Typical insertion loss

6.5 dB at 10.0 MHz
8.0 dB at 18.0 GHz
10.0 dB at 26.5 GHz
11.0 dB at 40.0 GHz
13.0 dB at 50.0 GHz

Typical minimum input power for a 40 dB return loss measurement at 18 GHz: +2 dBm

Dimensions: 26 H x 124 W x 118 mm D
(1.0 x 4.9 x 4.4 in)

Weight: Net 0.5 kg (1.2 lb), Shipping 2.3 kg (5 lb)

Accessories included with directional bridges:

85027A

7 mm open/short
Type-N (m)–(m) adapter

85027B

3.5 mm (m) open/short
3.5 mm (m)–(m) adapter
3.5 mm (m)–(f) adapter

85027C

Type-N (m) short
Type-N (m) shielded open
Type-N (m)–(m) adapter

85027D

2.4 mm (f) open
2.4 mm (f) short

85027E

3.5 mm (f) open/short
3.5 mm (f)–(f) adapter
3.5 mm (f)–(m) adapter

Power splitters

The Agilent 11667 series power splitters are two-resistor splitters recommended for external source leveling or for ratio measurement applications.



General information

Impedance: 50 ohms nominal

Maximum input power: +27 dBm

Dimensions: 46 H x 52 W x 21 mm D
(1.8 x 2.0 x 0.8 in)

Weight: Net 0.14 kg (0.3 lb), Shipping 0.22 kg (0.5 lb)

Power dividers

The Agilent 11636 series power dividers are three-resistor splitters intended for direct power dividing applications such as transmission line fault location. The 11636 series can also be used as a power combiner.

General information

Impedance: 50 ohms nominal

Dimensions: 42 H x 45 W x 18 mm D
(1.6 x 1.8 x 0.7 in)

Weight: Net 0.14 kg (0.3 lb), Shipping 0.45 kg (1.0 lb)

Power splitters

Model	Frequency range	Input connector	Output connectors	Frequency	Insertion loss (typical)	Equivalent output match	Output tracking
11667A	DC to 18 GHz	Type-N (f) ¹	Type-N (f)	DC to 4 GHz	6.6 dB	1.10 SWR	0.15 dB
				4 to 8 GHz	7.0 dB	1.20 SWR	0.20 dB
				8 to 18 GHz	7.8 dB	1.33 SWR	0.25 dB
11667B	DC to 26.5 GHz	3.5 mm (f)	3.5 mm (f)	DC to 8 GHz	6.5 dB	1.22 SWR	0.25 dB
				8 to 18 GHz	7.0 dB	1.22 SWR	0.25 dB
				18 to 26.5 GHz	7.3 dB	1.22 SWR	0.40 dB
11667C	DC to 50 GHz	2.4 mm (f)	2.4 mm (f)	DC to 18 GHz	6.0 dB	1.29 SWR	0.30 dB
				18 to 26.5 GHz	7.0 dB	1.20 SWR	0.35 dB
				26.5 to 40 GHz	8.0 dB	1.50 SWR	0.40 dB
				40 to 50 GHz	8.5 dB	1.65 SWR (typical)	0.40 dB

Power dividers

Model	Frequency range	Input connector	Output connectors	Frequency	Output match	Output tracking
11636A	DC to 18 GHz	Type-N (m)	Type-N (f)	DC to 4 GHz	1.25 SWR	0.20 dB
				4 to 10 GHz	1.25 SWR	0.40 dB
				10 to 18 GHz	1.35 SWR	0.50 dB
11636B	DC to 26.5 GHz	3.5 mm (f)	3.5 mm (f)	DC to 10 GHz	1.22 SWR	0.25 dB
				10 to 18 GHz	1.29 SWR	0.50 dB
				18 to 26.5 GHz	1.29 SWR	0.50 dB

1. Option 001 changes the input connector to Type-N (m).

System accessories, continued

Agilent 11679A/B extension cables

These cables extend the distance between the scalar network analyzer and the detector or bridge to a maximum of 200 feet without degradation of performance.

11679A 7.6 m (25 ft) extension cable

11679B 61 m (200 ft) extension cable

Agilent 11665B modulator

Note: This product is no longer available. The 11665B modulator is only necessary when using the 8340/8341 series synthesizer.

The 11665B modulates test signals with the 27.8 kHz modulation drive signal from the scalar network analyzer.

Frequency range: 15 MHz to 18 GHz

Insertion loss and return loss

Frequency	Return loss	Insertion loss	
		ON (+50 mA)	OFF (-50 mA)
15 MHz to 40 MHz	>10 dB	<7.0 dB	>35 dB
40 MHz to 4 GHz	>15 dB	<3.2 dB	>35 dB
4 GHz to 8 GHz	>12 dB	<3.8 dB	>40 dB
8 GHz to 12.4 GHz	>8 dB	<4.3 dB	>45 dB
12.4 GHz to 18 GHz	>8 dB	<5.0 dB	>45 dB

Maximum input: +24 dBm

Connectors: Input: Type-N (f), Output: Type-N (m)

Weight: Net: 0.17 kg (0.38 lbs), Shipping: 0.9 kg (2 lbs)

Agilent 85022A system cable kit

The 85022A contains the BNC and GPIB cables needed to connect a source to the 8757.

Contents

GPIB cable, 100 cm (3.3 ft.), 3 each

50 ohm BNC (m) cable, 61 cm (2 ft.), 3 each

50 ohm BNC (m) cable, 122 cm (4 ft.)

Weight: Net: 0.5 kg (1.2 lbs.), Shipping: 1.2 kg (2.9 lbs)

Agilent 11613B calibrator

The 11613B is a dedicated transfer standard for calibration of the 8757. The 11613B provides the standard, a 27.778 kHz source, and a series of precision attenuators. The calibrator includes software (3.5-inch format) that operates on an HP 9000 series 200 or 300 computer, the BASIC operating system (BASIC 3.0 or higher), or an external controller with HP BASIC for Windows 7.0 or higher. The software verifies (and adjusts if necessary) the internal calibration parameters stored in the nonvolatile memory of the 8757. All 8757 detector inputs can be calibrated in a matter of minutes. Recalibration of the 11613B is recommended every two years.

Memory requirement: 0.5 Mbyte

Outputs

The 5-pin cable (1.22 m) mates with the detector inputs of the 8757. The lines in this cable transfer the squarewave signal to the 8757, provide power for the 11613B (from the 8757 supply), and program the 11613B's internal attenuators.

Dimensions: 40 H x 185 W x 203 mm D
(1.5 x 7.3 x 8.0 in)

Cable length: 1.22 m (48 in)

Weight: Net: 0.91 kg (2 lbs), Shipping: 2.3 kg (5 lbs)

Web resources

Visit our Web sites for additional product information and literature.

Scalar Network Analyzers
www.agilent.com/find/8757

RF & MW Network Analyzers
www.agilent.com/find/na

Literature guide

Agilent 8757D scalar network analyzer, Configuration Guide

5967-6177E

Improving network analyzer measurements of frequency-translating devices, Application Note 1287-7

5966-3318E

Network analyzer measurements: filter and amplifier examples, Application Note 1287-4

5965-7710E

Microwave component measurements; amplifier measurements using the scalar network analyzer, Application Note 345-1

5954-1599

Measuring voltage-controlled devices with the Agilent 8757A scalar network analyzer, Product Note 8757-5

5964-1537

Improving scalar network analysis using the PSG signal generator and the 8757D scalar network analyzer, Application Note 1435

5988-8432EN



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