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 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.

<table>
<thead>
<tr>
<th>Network analyzer</th>
<th>Traces</th>
<th>Selectable number of points</th>
</tr>
</thead>
<tbody>
<tr>
<td>8757D</td>
<td>1</td>
<td>101, 201, 401, 801, 1601</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>101, 201, 401, 801</td>
</tr>
<tr>
<td></td>
<td>3, 4</td>
<td>101, 201, 401</td>
</tr>
</tbody>
</table>

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” of “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.

<table>
<thead>
<tr>
<th>Number of points</th>
<th>Minimum sweep time (ms)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 trace</td>
</tr>
<tr>
<td>101</td>
<td>40</td>
</tr>
<tr>
<td>201</td>
<td>50</td>
</tr>
<tr>
<td>401</td>
<td>100</td>
</tr>
<tr>
<td>801</td>
<td>200</td>
</tr>
<tr>
<td>1601</td>
<td>400</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Display mode</th>
<th>Scale resolution</th>
<th>Display range</th>
<th>Vertical resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>dBm</td>
<td>0.1 to 20 dB/div (1/2/5 sequence)</td>
<td>–80 to +80 dBm</td>
<td>0.003 dB</td>
</tr>
<tr>
<td>dB</td>
<td>0.1 to 20 dB/div (1/2/5 sequence)</td>
<td>–90 to +90 dB</td>
<td>0.006 dB</td>
</tr>
<tr>
<td>Normalized ratio measurements</td>
<td>0.1 to 20 dB/div (1/2/5 sequence)</td>
<td>–180 to +180 dB</td>
<td>0.01 dB</td>
</tr>
<tr>
<td>SWR</td>
<td>0.02 to 10 units/div (1/2/4 sequence)</td>
<td>1.0 to 37.0</td>
<td>0.01 at 1, 0.1 at 10, 0.27 at 30</td>
</tr>
<tr>
<td>AUX voltage</td>
<td>0.025 to 5 V/div (1/2/5/9 sequence)</td>
<td>–10 to +10 V</td>
<td>0.001 V</td>
</tr>
</tbody>
</table>

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 ±20 Hz
≥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 ±12 Hz
Symmetry: 50% ±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)
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 PSG signal generators (Option 007)
• Agilent 8360 series synthesized sweeper
• Agilent 8370 series synthesized sweeper

Printers

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)

<table>
<thead>
<tr>
<th>Uncertainty component</th>
<th>85037B precision detector</th>
<th>85025E detector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dynamic accuracy (±dB)</td>
<td>0.11</td>
<td>0.40</td>
</tr>
<tr>
<td>Mismatch (±dB)</td>
<td>0.45</td>
<td>0.33</td>
</tr>
<tr>
<td>Total (±dB)</td>
<td>0.56</td>
<td>0.73</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Uncertainty component</th>
<th>85037B precision detector</th>
<th>85025E detector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dynamic accuracy (±dB)</td>
<td>0.96</td>
<td>2.00</td>
</tr>
<tr>
<td>Mismatch (±dB)</td>
<td>0.45</td>
<td>0.33</td>
</tr>
<tr>
<td>Total (±dB)</td>
<td>1.41</td>
<td>2.33</td>
</tr>
</tbody>
</table>

### 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**

<table>
<thead>
<tr>
<th>Uncertainty component</th>
<th>85037B precision detector</th>
<th>85025E detector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absolute power accuracy at 50 MHz (±dB)</td>
<td>0.11</td>
<td>0.50</td>
</tr>
<tr>
<td>Frequency response (±dB)</td>
<td>0.18</td>
<td>0.50</td>
</tr>
<tr>
<td>Mismatch (±dB)</td>
<td>0.18</td>
<td>0.10</td>
</tr>
<tr>
<td>Total (±dB)</td>
<td>0.47</td>
<td>1.10</td>
</tr>
</tbody>
</table>

**Power = 0 dBm**

<table>
<thead>
<tr>
<th>Uncertainty component</th>
<th>85037B precision detector</th>
<th>85025E detector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absolute power accuracy at 50 MHz (±dB)</td>
<td>0.11</td>
<td>0.40</td>
</tr>
<tr>
<td>Frequency response (±dB)</td>
<td>0.18</td>
<td>0.50</td>
</tr>
<tr>
<td>Mismatch (±dB)</td>
<td>0.18</td>
<td>0.10</td>
</tr>
<tr>
<td>Total (±dB)</td>
<td>0.47</td>
<td>1.00</td>
</tr>
</tbody>
</table>

**Power = 50 dBm**

<table>
<thead>
<tr>
<th>Uncertainty component</th>
<th>85037B precision detector</th>
<th>85025E detector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absolute power accuracy at 50 MHz (±dB)</td>
<td>0.85</td>
<td>1.30</td>
</tr>
<tr>
<td>Frequency response (±dB)</td>
<td>0.18</td>
<td>0.50</td>
</tr>
<tr>
<td>Mismatch (±dB)</td>
<td>0.18</td>
<td>0.10</td>
</tr>
<tr>
<td>Total (±dB)</td>
<td>1.21</td>
<td>1.90</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Scalar terms</th>
<th>Equivalent power meter/sensor terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absolute power accuracy at 50 MHz</td>
<td>Power reference uncertainty</td>
</tr>
<tr>
<td></td>
<td>Instrument linearity</td>
</tr>
<tr>
<td></td>
<td>Zero set</td>
</tr>
<tr>
<td></td>
<td>Noise</td>
</tr>
<tr>
<td>Frequency response</td>
<td>Sensor calibration factor uncertainty</td>
</tr>
<tr>
<td>Mismatch</td>
<td>Mismatch</td>
</tr>
</tbody>
</table>

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

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).

<table>
<thead>
<tr>
<th>Uncertainty component</th>
<th>Uncertainty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source match error</td>
<td>approximately ±0.2 dB</td>
</tr>
<tr>
<td>Directivity error</td>
<td>approximately ±0.4 dB</td>
</tr>
<tr>
<td>Total uncertainty</td>
<td>approximately ±0.6 dB</td>
</tr>
</tbody>
</table>
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.

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)

System accessories

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

<table>
<thead>
<tr>
<th>Model</th>
<th>Frequency range</th>
<th>Connector type</th>
<th>Dynamic range</th>
<th>Frequency</th>
<th>Return loss</th>
<th>Frequency response°</th>
</tr>
</thead>
<tbody>
<tr>
<td>85037A</td>
<td>10 MHz to 18 GHz</td>
<td>Type-N (m)</td>
<td>AC mode +20 to –55 dBm</td>
<td>0.01 to 0.04 GHz</td>
<td>10 dB</td>
<td>±0.35 dB</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7 mm²</td>
<td>DC mode +20 to –50 dBm</td>
<td>0.04 to 18 GHz</td>
<td>20 dB</td>
<td>±0.18 dB</td>
</tr>
<tr>
<td>85037B</td>
<td>10 MHz to 26.5 GHz</td>
<td>3.5 mm (m)</td>
<td>AC mode +20 to –55 dBm</td>
<td>0.01 to 0.04 GHz</td>
<td>10 dB</td>
<td>±0.35 dB</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>DC mode +20 to –50 dBm</td>
<td>0.04 to 18 GHz</td>
<td>20 dB</td>
<td>±0.18 dB</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18 to 26.5 GHz</td>
<td>18 dB</td>
<td>±0.22 dB</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model</th>
<th>Power (50 MHz)</th>
<th>Dynamic accuracy15 Corrected</th>
<th>Default</th>
<th>Absolute accuracy14 Corrected</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>85037A/B</td>
<td>20 dBm</td>
<td>±0.25 dB</td>
<td>±0.40 dB</td>
<td>±0.25 dB</td>
<td>±0.40 dB</td>
</tr>
<tr>
<td></td>
<td>10 dBm</td>
<td>±0.11 dB</td>
<td>±0.40 dB</td>
<td>±0.11 dB</td>
<td>±0.40 dB</td>
</tr>
<tr>
<td></td>
<td>–30 dBm</td>
<td>±0.11 dB</td>
<td>±0.40 dB</td>
<td>±0.11 dB</td>
<td>±0.40 dB</td>
</tr>
<tr>
<td></td>
<td>–40 dBm</td>
<td>±0.40 dB</td>
<td>±0.80 dB</td>
<td>±0.40 dB</td>
<td>±0.80 dB</td>
</tr>
<tr>
<td></td>
<td>–50 dBm</td>
<td>±0.85 dB</td>
<td>±1.30 dB</td>
<td>±0.85 dB</td>
<td>±1.30 dB</td>
</tr>
<tr>
<td></td>
<td>–55 dBm</td>
<td>±0.85 dB</td>
<td>±1.30 dB</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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
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

<table>
<thead>
<tr>
<th>Model</th>
<th>Frequency range</th>
<th>Connector type</th>
<th>Dynamic range</th>
<th>Frequency</th>
<th>Return loss</th>
<th>Frequency response</th>
<th>Power</th>
<th>Dynamic accuracy</th>
<th>Absolute accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>85025A¹</td>
<td>10 MHz to 18 GHz</td>
<td>Type-N (m)</td>
<td>AC mode</td>
<td>0.01 to 0.04 GHz</td>
<td>10 dB</td>
<td>±0.8 dB</td>
<td>16 dBm</td>
<td>±0.8 dB</td>
<td>±0.8 dB</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7 mm¹</td>
<td>+16 to -55 dBm</td>
<td>0.04 to 4 GHz</td>
<td>20 dB</td>
<td>±0.5 dB</td>
<td>6 dBm</td>
<td>±0.4 dB</td>
<td>±0.4 dB</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>DC mode</td>
<td>4 to 18 GHz</td>
<td>17 dB</td>
<td>±0.5 dB</td>
<td>-35 dBm</td>
<td>±0.4 dB</td>
<td>±0.4 dB</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>+16 to -50 dBm</td>
<td>18 to 40 GHz</td>
<td>12 dB</td>
<td>±2.0 dB</td>
<td>-50 dBm</td>
<td>±1.3 dB</td>
<td>±1.3 dB</td>
</tr>
<tr>
<td>85025B¹</td>
<td>10 MHz to 26.5 GHz</td>
<td>3.5 mm (m)</td>
<td>AC mode</td>
<td>0.01 to 0.04 GHz</td>
<td>10 dB</td>
<td>±0.8 dB</td>
<td>16 dBm</td>
<td>±0.8 dB</td>
<td>±0.8 dB</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>+16 to -55 dBm</td>
<td>0.04 to 4 GHz</td>
<td>20 dB</td>
<td>±0.5 dB</td>
<td>6 dBm</td>
<td>±0.4 dB</td>
<td>±0.4 dB</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>DC mode</td>
<td>4 to 18 GHz</td>
<td>17 dB</td>
<td>±0.5 dB</td>
<td>-35 dBm</td>
<td>±0.4 dB</td>
<td>±0.4 dB</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>+16 to -50 dBm</td>
<td>18 to 26.5 GHz</td>
<td>12 dB</td>
<td>±2.0 dB</td>
<td>-55 dBm</td>
<td>±1.6 dB</td>
<td>±1.6 dB</td>
</tr>
<tr>
<td>85025D¹</td>
<td>10 MHz to 50 GHz</td>
<td>2.4 mm (m)</td>
<td>AC mode</td>
<td>0.01 to 0.1 GHz</td>
<td>10 dB</td>
<td>±0.8 dB</td>
<td>16 dBm</td>
<td>±1.0 dB</td>
<td>±1.0 dB</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>+16 to -55 dBm</td>
<td>0.1 to 2 GHz</td>
<td>20 dB</td>
<td>±0.5 dB</td>
<td>6 dBm</td>
<td>±0.4 dB</td>
<td>±0.4 dB</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>DC mode</td>
<td>20 to 26.5 GHz</td>
<td>20 dB</td>
<td>±1.0 dB</td>
<td>-35 dBm</td>
<td>±0.4 dB</td>
<td>±0.4 dB</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>+16 to -50 dBm</td>
<td>25 to 50 GHz</td>
<td>15 dB</td>
<td>±2.5 dB</td>
<td>-50 dBm</td>
<td>±1.3 dB</td>
<td>±1.3 dB</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>40 to 50 GHz</td>
<td>9 dB</td>
<td>±3.0 dB</td>
<td>-55 dBm</td>
<td>±1.6 dB</td>
<td>±1.6 dB</td>
</tr>
<tr>
<td>85025E¹</td>
<td>10 MHz to 26.5 GHz</td>
<td>3.5 mm (m)</td>
<td>AC mode</td>
<td>0.01 to 0.1 GHz</td>
<td>10 dB</td>
<td>±0.8 dB</td>
<td>16 dBm</td>
<td>±1.0 dB</td>
<td>±1.0 dB</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>+16 to -55 dBm</td>
<td>0.1 to 1.8 GHz</td>
<td>25 dB</td>
<td>±0.5 dB</td>
<td>6 dBm</td>
<td>±0.4 dB</td>
<td>±0.4 dB</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>DC mode</td>
<td>18 to 25 GHz</td>
<td>25 dB</td>
<td>±0.5 dB</td>
<td>-35 dBm</td>
<td>±0.4 dB</td>
<td>±0.4 dB</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>+16 to -50 dBm</td>
<td>25 to 26.5 GHz</td>
<td>23 dB</td>
<td>±1.4 dB</td>
<td>-55 dBm</td>
<td>±1.3 dB</td>
<td>±1.3 dB</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Model</th>
<th>Frequency range</th>
<th>Connector type</th>
<th>Dynamic range</th>
<th>Return loss</th>
<th>Frequency response</th>
<th>Dynamic accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>R85026A¹</td>
<td>26.5 to 40 GHz</td>
<td>WR-28</td>
<td>+10 to −50 dBm (AC mode)</td>
<td>12 dB</td>
<td>±1.5 dB</td>
<td>±(0.3 dB + 0.03 dB/dB)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>+10 to −45 dBm (DC mode)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q85026A¹</td>
<td>33 to 50 GHz</td>
<td>WR-22</td>
<td>+10 to −50 dBm (AC mode)</td>
<td>12 dB</td>
<td>±2.0 dB</td>
<td>±(0.3 dB + 0.03 dB/dB)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>+10 to −45 dBm (DC mode)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U85026A¹</td>
<td>40 to 60 GHz</td>
<td>WR-19</td>
<td>+10 to −50 dBm (AC mode)</td>
<td>12 dB</td>
<td>±2.0 dB</td>
<td>±(0.3 dB + 0.03 dB/dB)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>+10 to −45 dBm (DC mode)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>85025CK-K57</td>
<td>50 to 75 GHz</td>
<td>WR-15</td>
<td>+10 to −45 dBm (typical)</td>
<td>9.5 dB (typical)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>85025CK-K71¹</td>
<td>75 to 110 GHz</td>
<td>WR-10</td>
<td>+10 to −45 dBm (typical)</td>
<td>9.5 dB (typical)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>85025C</td>
<td>1. SMA (m)</td>
<td>²</td>
<td>³</td>
<td>⁴</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.
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 °C, +7 dBm input)

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

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

<table>
<thead>
<tr>
<th>Model</th>
<th>Frequency range</th>
<th>Nominal impedance</th>
<th>Input connector</th>
<th>Test port connector</th>
<th>Frequency</th>
<th>Directivity</th>
<th>Frequency</th>
<th>Test port match</th>
</tr>
</thead>
<tbody>
<tr>
<td>85027A</td>
<td>10 MHz to 18 GHz</td>
<td>50 ohms</td>
<td>Type-N (f)</td>
<td>7 mm</td>
<td>0.01 to 18 GHz</td>
<td>40 dB</td>
<td>0.01 to 8.4 GHz</td>
<td>12.4 to 18 GHz</td>
</tr>
<tr>
<td>85027B</td>
<td>10 MHz to 26.5 GHz</td>
<td>50 ohms</td>
<td>3.5 mm (f)</td>
<td>3.5 mm (f)</td>
<td>0.01 to 20 GHz</td>
<td>40 dB</td>
<td>0.01 to 8.4 GHz</td>
<td>20 to 26.5 GHz</td>
</tr>
<tr>
<td>85027C</td>
<td>10 MHz to 18 GHz</td>
<td>50 ohms</td>
<td>Type-N (f)</td>
<td>Type-N (f)</td>
<td>0.01 to 12.4 GHz</td>
<td>36 dB</td>
<td>0.01 to 8.4 GHz</td>
<td>12.4 to 18 GHz</td>
</tr>
<tr>
<td>85027D</td>
<td>10 MHz to 50 GHz</td>
<td>50 ohms</td>
<td>2.4 mm (f)</td>
<td>2.4 mm (m)</td>
<td>0.01 to 26.5 GHz</td>
<td>35 dB</td>
<td>0.01 to 16 GHz</td>
<td>18 to 30 GHz</td>
</tr>
<tr>
<td>85027E</td>
<td>10 MHz to 26.5 GHz</td>
<td>50 ohms</td>
<td>3.5 mm (f)</td>
<td>3.5 mm (m)</td>
<td>0.01 to 20 GHz</td>
<td>40 dB</td>
<td>0.01 to 8.4 GHz</td>
<td>20 to 26.5 GHz</td>
</tr>
</tbody>
</table>
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)

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

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)

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

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

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Return loss</th>
<th>Insertion loss ON (+50 mA)</th>
<th>OFF (-50 mA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 MHz to 40 MHz</td>
<td>&gt;10 dB</td>
<td>&lt;7.0 dB</td>
<td>&gt;35 dB</td>
</tr>
<tr>
<td>40 MHz to 4 GHz</td>
<td>&gt;15 dB</td>
<td>&lt;3.2 dB</td>
<td>&gt;35 dB</td>
</tr>
<tr>
<td>4 GHz to 8 GHz</td>
<td>&gt;12 dB</td>
<td>&lt;3.8 dB</td>
<td>&gt;40 dB</td>
</tr>
<tr>
<td>8 GHz to 12.4 GHz</td>
<td>&gt;8 dB</td>
<td>&lt;4.3 dB</td>
<td>&gt;45 dB</td>
</tr>
<tr>
<td>12.4 GHz to 18 GHz</td>
<td>&gt;8 dB</td>
<td>&lt;5.0 dB</td>
<td>&gt;45 dB</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Title</th>
<th>Pub. number</th>
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<tbody>
<tr>
<td>Agilent 8757D scalar network analyzer, Configuration Guide</td>
<td>5967-6177E</td>
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<tr>
<td>Improving network analyzer measurements of frequency-translating devices, Application Note 1287-7</td>
<td>5966-3318E</td>
</tr>
<tr>
<td>Network analyzer measurements: filter and amplifier examples, Application Note 1287-4</td>
<td>5965-7710E</td>
</tr>
<tr>
<td>Microwave component measurements; amplifier measurements using the scalar network analyzer, Application Note 345-1</td>
<td>5954-1599</td>
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<tr>
<td>Measuring voltage-controlled devices with the Agilent 8757A scalar network analyzer, Product Note 8757-5</td>
<td>5964-1537</td>
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<tr>
<td>Improving scalar network analysis using the PSG signal generator and the 8757D scalar network analyzer, Application Note 1435</td>
<td>5988-8432EN</td>
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</table>
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<table>
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<tr>
<th>Americas</th>
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<tr>
<td>Canada</td>
<td>877 894 4414</td>
</tr>
<tr>
<td>Latin America</td>
<td>305 269 7500</td>
</tr>
<tr>
<td>United States</td>
<td>800 829 4444</td>
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<td>United Kingdom</td>
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