

# NETWORK ANALYZERS

## S-Parameter Test Sets

### HP 8753C Series

#### S-Parameter Test Sets

The S-parameter test sets provide the capability to measure reflection and transmission characteristics (including S-parameters) of two port devices in either direction with a single connection. The test sets are controlled from the HP 8753C and include programmable step attenuators.

#### HP 85046A/B S-Parameter Test Sets

The HP 85046A/B test sets provide the capability to simultaneously measure the transmission and reflection characteristics of 50  $\Omega$  and 75  $\Omega$  devices, respectively.

#### Specifications Summary

	HP 85046A	HP 85046B
<b>Impedance:</b>	50 $\Omega$	75 $\Omega$
<b>Frequency Range:</b>	300 kHz to 3 GHz	300 kHz to 2 GHz
<b>Directivity:</b>	35 dB to 1.3 GHz 30 dB to 3.0 GHz	35 dB to 1.3 GHz 30 dB to 2.0 GHz

#### Typical tracking

Transmission magnitude, phase <sup>1,2</sup> :		
0.3 MHz to 2.0 MHz	$\pm 1.5$ dB, $\pm 20^\circ$	$\pm 1.5$ dB, $\pm 20^\circ$
2.0 MHz to Fmax	$\pm 1.5$ dB, $\pm 10^\circ$	$\pm 1.5$ dB, $\pm 10^\circ$

Reflection magnitude, phase <sup>1,2</sup> :		
0.3 MHz to 2.0 MHz	$\pm 1.5$ dB, $\pm 25^\circ$	$\pm 1.5$ dB, $\pm 25^\circ$
2.0 MHz to Fmax	$\pm 1.5$ dB, $\pm 10^\circ$	$\pm 1.5$ dB, $\pm 10^\circ$

#### Effective source match<sup>1</sup> (Test Ports):

0.3 MHz to 2.0 MHz	14 dB	14 dB
2.0 MHz to 1.3 GHz	20 dB	17 dB
1.3 GHz to Fmax	16 dB	16 dB

#### RF connectors

<b>Test Ports:</b>	Precision 7 mm	75 $\Omega$ Type N (female)
<b>All others:</b>	50 $\Omega$ Type N (female)	50 $\Omega$ Type N (female)

**Includes:** Four 190 mm (7.5 in) cables with Type N (male) connectors for connection to the HP 8753C. One HP 8753C test set interconnect cable.

#### Physical Characteristics

**Size:** 90 mm H  $\times$  426 mm W  $\times$  533 mm D (3.5 in  $\times$  16.75 in  $\times$  21.5 in)  
**Weight:** Net, 9.1 kg (20 lb); shipping, 10 kg (22 lb).

#### HP 85047A S-Parameter Test Set

The HP 85047A test set includes a frequency doubler that can be switched in to measure 3 MHz to 6 GHz in a single sweep or switched out to measure 300 kHz to 3 GHz in a single sweep. The HP 8753C controls the frequency doubler. HP 8753C Option 006 (6 GHz receiver) is required to activate the HP 85047A.

#### Specifications Summary

**Impedance:** 50  $\Omega$   
**Frequency ranges:** 300 kHz to 3 GHz  
3 MHz to 6 GHz

**Directivity:** 300 kHz to 1.3 GHz: 35 dB  
1.3 GHz to 3 GHz: 30 dB  
3 GHz to 6 GHz: 25 dB

#### Typical tracking

**Transmission magnitude, phase:**  
300 kHz to 3 GHz:  $\pm 1.5$  dB,  $\pm 10^\circ$   
3 GHz to 6 GHz: +0.5, -2.5 dB,  $\pm 20^\circ$

**Reflection magnitude, phase:**  
300 kHz to 3 GHz:  $\pm 1.5$  dB,  $\pm 10^\circ$   
3 GHz to 6 GHz:  $\pm 1.5$  dB,  $\pm 20^\circ$

#### Effective source match:

300 kHz to 1.3 GHz: 20 dB  
1.3 GHz to 3 GHz: 16 dB  
3 GHz to 6 GHz: 14 dB

#### RF connectors

**Test ports:** Precision 7 mm

**All others:** 50  $\Omega$  type N (female)

**Includes:** Four 190 mm (7.5 in) cables with Type N (male) connectors for connection to the HP 8753C, one HP 8753C test set interconnect cable

#### Physical Characteristics

**Size:** 90 mm H  $\times$  426 mm W  $\times$  533 mm D (3.5 in  $\times$  16.75 in  $\times$  21.5 in)  
**Weight:** Net, 10 kg (22 lb); shipping, 11.5 kg (25.3 lb)

#### Solid-State Switching

Solid-state switching allows for simultaneous measurement of forward and reverse parameters and continuous update of all 4 S-parameters as required for 2-port error correction (used to achieve best possible measurement accuracy). Option 009 replaces the standard solid-state RF test port switch with a mechanical RF switch. HP 8753 systems specifications for standard and Option 009 test sets are identical. Nominal insertion loss of the solid-state switch is less than 2 dB (@ 3 GHz) or 3dB (@ 6 GHz), relative to a mechanical switch.

The solid-state switch can be retrofitted into any existing HP 85046A/B or 85047A test set using the HP 86389A or 86389B solid-state switch upgrade kit. Solid-state switching test sets are supported on HP 8753C and HP 8753B network analyzers with firmware revision 3.0 or higher. For HP 8753A/B network analyzers with firmware revision 2.01 or lower, upgrade kits are available, which add support for solid-state test switching test sets.

#### HP 86389A/B Solid-State Switch Upgrade Kits

The HP 86389A/B kits retrofit any existing HP 85046A/B and HP 85047A S-parameter test set by replacing the mechanical RF test port switch with a solid-state RF switch. This solid-state switch allows for simultaneous measurement of forward and reverse parameters and continuous measurement of all 4 S-parameters (required for 2-port error correction).

The HP 86389A retrofits HP 85046A/B test sets, and the HP 86389B retrofits HP 85047A test sets. HP 8753B/C network analyzers with firmware revision 3.0 or higher support solid-state test sets. HP 8753A/B network analyzers with firmware revision 2.01 or lower must be upgraded (HP 11882A for the HP 8753A, HP 86388A for the HP 8753B). These kits include installation at an HP service center.

<sup>1</sup>Degrees, specified as deviation from linear phase.

<sup>2</sup>F max is the upper frequency limit of the associated test set.

<sup>3</sup>Can be improved through Accuracy Enhancement.