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NETWORK ANALYZERS
8757/8756 System Accessories
Models 85027A/B/C/D/E, 85020A/B, 85025A/B/C/D/E, 11664A/C/D/E, R/Q/U 85026A

Directional Bridges

The HP 85020 series and HP 85027 series are directional bridges designed especially for the HP 8757, 8756 and 8755 scalar network analyzers. Each bridge features outstanding directivity and test port match in a compact, rugged package.

Within each bridge, one zero-bias Schottky diode detector measures the return loss of the test device. Ratio measurements can be made by adding a power splitter (HP 11667A/B/C) and detector (HP 11664 series or HP 85025 series).

HP 85027A/B/C/D/E Directional Bridges

The HP 85027 series directional bridges are designed to operate with the HP 8757, 8756 and 8755 scalar network analyzers for reflection measurements from 10 MHz to 47 GHz. A switch on the HP 85027 series bridges allows the user to configure them for operation with the HP 8757 or the HP 8756 and 8755 scalar network analyzers.

When used with the HP 8757 scalar network analyzer, the HP 85027 series bridges allow the user to choose the measurement mode that best suits the application. Use the bridge's AC mode (modulated RF) for measurements in the presence of undesired signals such as broadband noise or electromagnetic interference. Or choose the bridge's DC mode (unmodulated RF) to measure the return loss of modulation sensitive devices such as amplifiers with gain control circuits. Use the companion HP 85025 series detectors for AC and DC measurement versatility or the HP 11664 series detectors for AC only measurements.

High (40 dB) directivity and excellent test port match ensure accurate reflection measurements over a broad swept frequency range. The HP 85027B bridge operates from 10 MHz to 26.5 GHz and has an SMA compatible, precision female 3.5mm (typical) test port connector. The HP 85027A/C bridges operate from 10 MHz to 18 GHz. The HP 85027A has a rugged 7mm (typical) test port connector and the HP 85027C has a precision Type-N connector. The HP 85027E operates from 10 MHz to 26.5 GHz and has an SMA compatible, precision male 3.5mm (typical) test port connector. Reflection measurements from 10 MHz to 47 GHz are possible using the HP 85027D directional bridge.

Measuring SMA devices

Hewlett-Packard recommends using the HP 85027A bridge and an 7mm (typical) to 3.5mm (typical) adapter for measuring SMA devices from 10 MHz to 18 GHz. For SMA measurements to 26.5 GHz, HP recommends using 3.5mm (typical) to 3.5mm (typical) adapters (included with the HP 85027B/E bridge) to preserve the HP 85027B/E output connector.

HP 85020A/B Directional Bridges

The economical HP 85020A/B directional bridges also offer high (40 dB) directivity and excellent port match at RF (to 4.3 GHz) frequencies. For 50 ohm measurements choose the HP 85020A. The HP 85020B is designed for 75 ohm environments. Both RF bridges have Type-N connectors.

Detectors

Two types of detectors are available for use with HP scalar network analyzers for measurements up to 60 GHz. All detectors provide excellent impedance match, and therefore minimize mismatch uncertainty in scalar measurements.

HP 85025 and 85026 Series Detectors (AC/DC)

The HP 85025 and 85026 series detectors are designed specifically for operation with the HP 8757 Scalar Network Analyzer and are not compatible with either the HP 8756A or the 8755. The HP 85025/26 detectors detect either a modulated (AC) or an unmodulated (DC) microwave signal. In AC mode, the HP 85025/26 series detect the envelope of the 27.8 kHz modulated microwave signal, provided internally by the HP 8350B Sweep Oscillator with RF plug-in or externally with the HP 8340/41 synthesized sweepers. In DC mode, the HP 85025/26 series detectors measure the microwave power directly without modulation. The user can change detection modes from the HP 8757 front panel.

HP 11664 Series Detectors (AC Only)

The HP 11664 series detectors are designed to operate with the HP 8757, 8756 and 8755 scalar analyzers in AC mode only. The HP 11664A/E cover the 10 MHz to 26.5 GHz range, and the HP 11664D covers from 26.5 to 40 GHz.

Detector Adapters

The HP 85025C and the HP 11664C Detector Adapters match the scalar analyzer display to most standard crystal, silicon, and gallium arsenide detectors. This enables the user to operate in any frequency band, such as above 60 GHz with the HP 8757A, and above 40 GHz with the HP 8756A.

The HP 85025C Detector Adapter is designed for use with the HP 8757 only, and can operate in either AC or DC detection modes. A softkey calibration sequence calibrates the HP 8757 display to your particular detector for an accurate display of power level. The analyzer can then account for the voltage versus input power characteristics of the detector in use. This calibration requires two known calibration inputs, one at a high level (linear operating region, above 0 dBm) and one at a low level (square law region, below −20 dBm).

The HP 11664C Detector Adapter is designed for use with the HP 8757, 8756, and 8755 scalar analyzers. The HP 11664C is matched to the particular diode used via two screwdriver adjustments. One adjustment sets the adapter's amplifier gain to the correct power level indication on the scalar network analyzer. The second adjustment matches the input impedance of the adapter to the load impedance of the detector. Together, the voltage versus power characteristics of the detector are calibrated for the scalar analyzer display.

Detector Summary

For use with the HP 8757, 8756, or 8755 in AC detection mode only:

Detector	Freq. Range (GHz)	Connector Type	Return Loss (dB)	Dynamic Range 8757	Dynamic Range 8756	Weight Net	Weight Shipping
11664A[1]	.01-18	Type-N (m)	.01-.04 GHz: 10 dB .04-4 GHz: 20 dB 4-12 GHz: 18 dB 12-18 GHz: 16 dB	+16 to −60 dBm	+10 to −50 dBm	0.17 kg (0.4 lb)	0.9 kg (2 lb)
11664E	.01-26.5	3.5 mm (m)	.01-.04 GHz: 10 dB .04-6 GHz: 20 dB 6-20 GHz 16 dB 20-26.5 GHz: 12 dB	+16 to −60 dBm	+10 to −50 dBm	"	"
11664D	26.5-40	WR-28	12 dB	+10 to −50 dBm	+10 to −50 dBm	0.24 kg (0.5 lb)	1.0 kg (2.2 lb)
11664C	[3]	SMA (m)	[3]	[3]	[3]	0.17 kg (0.4 lb)	0.9 kg (2 lb)

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Detector Summary (cont'd)

For use with HP 8757 only in either AC or DC detection modes:

					AC mode	DC mode		
85025A[1, 2]	.01-18	Type-N (m)	.01-.04 GHz: .04-4 GHz: 4-18 GHz:	10 dB 20 dB 17 dB	+16 to –55 dBm	+16 to –50 dBm	0.24 kg (0.5 lb)	1.0 kg (2.2 kg)
85025B[2]	.01-26.5	3.5mm (m)	.01-18 GHz: 18-26.5 GHz:	Same as 85025A 12 dB	+16 to –55 dBm	+16 to –50 dBm	"	"
85025D	.01-50 GHz	2.4mm (m)	10-40 MHz: 40-100 MHz: .1-14 GHz: 14-34 GHz: 34-40 GHz: 40-50 GHz:	10 dB 20 dB 23 dB 20 dB 15 dB 9 dB	+16 to –55 dBm	+16 to –50 dBm	"	"
85025E	.01-26.5 GHz	3.5mm (m)	10-40 MHz: 40-100 MHz: .1-25 GHz: 25-26.5 GHz:	10 dB 20 dB 25 dB 23 dB	+16 to –55 dBm	+16 to –50 dBm	"	"
R85026A[2]	26.5-40	WR-28	12 dB		+10 to –50 dBm	+10 to –45 dBm	"	"
Q85026A[2]	33-50	WR-22	12 dB		+10 to –50 dBm	+10 to –45 dBm	"	"
U85026A[2]	40-60	WR-19	12 dB		+10 to –50 dBm	+10 to –45 dBm	"	"
85025C K57[4]	55-65 GHz	WR-15			–10 to –50 dBM (typical)	–10 to –45 dBm (typical)	"	"
85025C K71[4]	90-100 GHz	WR-18			–10 to –50 dBm (typical)	–10 to –45 dBm (typical)	"	"
85025C[2]	[3]	SMA (m)	[3]		[3]	[3]	"	"

Directional Bridge Summary

For use with the HP 8757, 8756, or 8755 in AC detection mode only:

Bridge	Freq. Range (GHz)	Nominal Impedance	Connector Input	Connector Test port	Directivity (dB)	Test Port Match (SWR)	Weight Net	Weight Shipping
85020A	.01-4.3 GHz	50 ohms	Type-N (f)	Type-N (f)	.01-3 GHz: 40 dB 3-4.3 GHz: 34 dB	.01-3 GHz: <1.22 3-4.3 GHz: <1.25	0.5 kg (1.2 lb)	2.3 kg (5 lb)
85020B	.01-2.4 GHz	75 ohms	Type-N (f)	Type-N (f)	40 dB	.01-1.3 GHz: <1.25 1.3-2.4 GHz: <1.43	"	"

For use with the HP 8756, or 8755 in AC detection mode or with the HP 8757 in either AC or DC detection modes

85027A	.01-18 GHz	50 ohms	Type-N (f)	7mm	40 dB	.01-8.4 GHz: <1.15 8.4-12.4 GHz: <1.25 12.4-18 GHz: <1.43	0.5 kg (1.2 lb)	2.3 kg (5 lb)
85027B	.01-26.5 GHz	50 ohms	3.5mm (f)	3.5mm (f)	.01-20 GHz: 40 dB 20-26.5 GHz: 36 dB	.01-8.4 GHz: <1.15 8.4-20 GHz: <1.43 20-26.5 GHz: <1.75	"	"
85027C	.01-18 GHz	50 ohms	Type-N (f)	Type-N (f)	.01-12.4 GHz: 36 dB 12.4-18 GHz: 34 dB	.01-8.4 GHz: <1.15 8.4-12.4 GHz: <1.25 12.4-18 GHz: <1.43	"	"
85027D	.01-47 GHz	50 ohms	2.4mm (f)	2.4mm (m)	.01-26.5 GHz: 35 dB 26.5-40 GHz: 30 dB 40-47 GHz: 25 dB	.01-16 GHz: <1.15 16-30 GHz: <1.25 30-40 GHz: <1.40 40-47 GHz: <1.85 (typical)	" " " "	" " " "
85027E	.01-26.5 GHz	50 ohms	3.5mm (f)	3.5mm (m)	.01-20 GHz: 40 dB 20-26.5 GHz: 36 dB	.01-8.4: <1.15 8.4-20 GHz: <1.43 20-26.5 GHz: <1.75	"	"

1. Option 001 changes to 7mm connector.
2. The HP 85025 and 85026 series detectors and the HP 85025C require HP 8757A firmware revision 2.0 or higher. To upgrade previous revisions order the HP 11614A Firmware Enhancement.
3. Depends on the particular external detector used.
4. The HP 85025C K57 requires the HP 85100V millimeter-wave source module and a HP 85025C K56 bandpass filter. The HP 85025C K71 requires the HP 85100W millimeter-wave source module and a HP 85025C K91 bandpass filter. For further information, contact your local HP sales office.

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