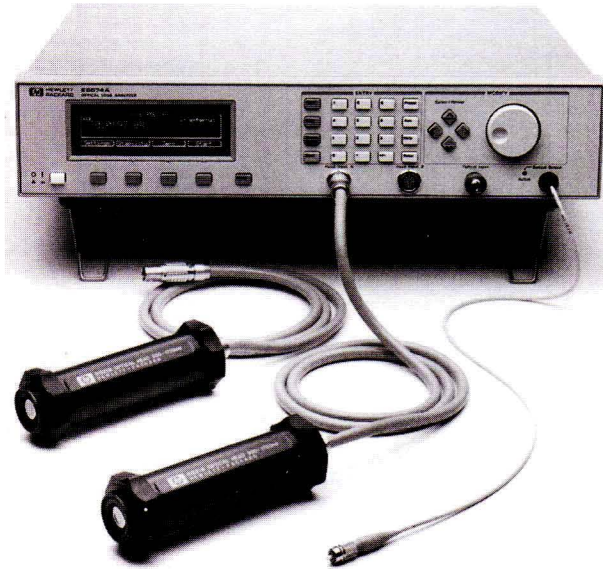
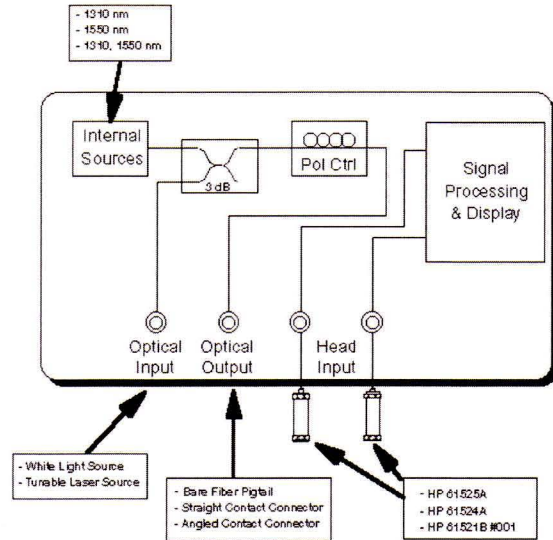


- Complete loss analysis solution
- Precise absolute power measurements
- Optimized for polarization dependent loss test (PDL)



The Agilent E5574A optical loss analyzer offers flexible solutions. A variety of Fabry-Perot laser sources can be ordered. For swept wavelength measurements, an external tunable laser source or a white light source is also available.



Agilent E5574A block diagram

The Agilent E5574A optical loss analyzer is a complete solution for the loss/gain characterization of active and passive optical components. At the touch of a button, you can measure the various contributions to the total loss of your device—all together in one affordable instrument. It is especially optimized for polarization dependent loss and gain measurements with a typical PDL accuracy of 0.001 dB.

Whether you are concerned with the ease of use in manual applications on the bench or with the highest quality and measurement speed on the production floor, this optical loss analyzer is the perfect tool.

A pigtailed optical output provides polarization dependent loss measurements with the highest performance. Two other customer-exchangeable connector interface options, for straight or angled contact connectors, provide superb flexibility.

A selection of optical heads covers 800 to 1700 nm wavelengths and power levels between +27 and -90 dBm. For best PDL measurement performance between 1250 and 1570 nm, the Agilent 81521B Option 001 optical head should be used.

Specifications

The Agilent E5574A optical loss analyzer is produced to ISO 9001 international quality system standards as part of Agilent Technologies' commitment to continually increasing customer satisfaction through improved quality control.

Specifications describe the instrument's warranted performance. *Supplementary performance characteristics provide information about non-warranted instrument performance in the form of nominal values, and are printed in italic typeface.*

Absolute Power Measurement Specifications

Optical Head	81521B Option 001	81521B	81524A	81525A
Sensor Element	Ge, 5 mm	Ge, 5 mm	InGaAs, 5 mm	InGaAs, 5 mm
Wavelength Range	900–1700 nm	900–1700 nm	800–1650 nm	800–1650 nm
Power Range	+3 to –80 dBm	+3 to –80 dBm	+3 to –90 dBm	+27 to –70 dBm (1250–1650 nm) +23 to –70 dBm (800–1650 nm)
Uncertainty (Accuracy) at Reference Conditions^a	±2.2% (1000–1650 nm)	±2.2% (1000–1650 nm)	±2.2% (1000–1600 nm)	±3.0% (900–1600 nm)
Total Uncertainty^b	±4% ±50 pW (1000–1650 nm)	±4% ±50 pW (1000–1650 nm)	±4% ±5 pW (1000–1600 nm)	±5% ±500 pW (900–1600 nm)
Linearity (Power)	0 to –60 dBm	0 to –60 dBm	+3 to –70 dBm	+10 to –50 dBm ^c
18°C to 28°C, T=const.	±0.04 dB ±50 pW	±0.04 dB ±50 pW	±0.04 dB ±5 pW	±0.04 dB ±500 pW
Operating temp. range, T=const.	±0.15 dB ±50 pW	±0.15 dB ±50 pW	±0.15 dB ±5 pW	±0.15 dB ±500 pW
Noise (peak-to-peak) Averaging time 1 second	< 50 pW (1200–1600 nm)	< 50 pW (1200–1600 nm)	< 5 pW (1000–1600 nm)	< 500 pW (900–1600 nm)
Polarization Sensitivity	0.003 dB p-p ^d	N/A	N/A	N/A
Display Resolution	0.001 dBm The display may vary by ±1 count.			
Applicable Fiber Type	parallel beam, 9/125–100/140 μm, NA ≤0.3			

- At the following reference conditions:
 - Power level 10 μW (–20 dBm), continuous wave (CW).
 - Parallel beam, 3 mm spot diameter on detector.
 - Ambient temperature 23°C ±5K.
 - At day of calibration (add 0.3% for aging over one year, add 0.6% over two years).
 - Spectral width of source < 10 nm.
- At the following operating conditions:
 - Parallel beam, 3 mm spot diameter on detector or connectorized fiber with NA ≤0.2.
 - Ambient temperature within operating temperature range, non-condensing.
 - Within 1 year after calibration, add 0.3% for second year.
- Add ±0.007 dB/dB between 10 and 27 dBm.
- For single-mode fiber with NA ≤0.1, straight fiber end, 1250–1570 nm. Applies to low PDL mode with reduction of power range to –64 dBm.

Insertion Loss/Gain and Coupling Ratio Measurement Specifications

Laser Source	Option 013	Option 015	Option 135
Type	Fabry-Perot laser with built-in isolator	Fabry-Perot laser with built-in isolator	Fabry-Perot laser with built-in isolator
Central Wavelength	1310 ±20 nm	1550 ±20 nm	1310/1550 ±20 nm
Fiber Type	single-mode, 9/125 μm		
Display Resolution	0.001 dB		
Output Power ^a	≥10 dBm, ≥ 8 dBm typical		
CW-Stability (15 min, T=const)	±0.01 dB		
Backreflection Sensitivity (typical)	< 0.001 dB p-p @ 4% reflection		
Insertion Loss/Gain Range	maximum measurable gain [dB]: upper power limit of optical head [dBm] minus source output power [dBm] maximum measurable insertion loss [dB]: output power of source [dBm] minus sensitivity of optical head [dBm]		
Coupling Ratio/Directivity Range	any value within power range of optical head		
Linearity ^b	(>60 dBm at optical head)		
18°C to 28°C, T= const	±0.04 dB ±50 pW		
Operating temp. range, T= const	±0.15 dB ±50 pW		

a. Class 3A according to IEC 825-1 (1993), Class I according to FDA CFR 21 (1986).

b. Applies to Agilent 81521B Option 001. For other optical heads, check linearity specifications.

Polarization Dependent Loss (PDL), Gain (PDG), and Coupling Ratio (PDCR) Measurement Specifications

Specifications are measured with internal source and optical head Agilent 81521B Option 001.

Central Wavelength (with internal source)	1310 ±20 nm and/or 1550 ±20 nm
Wavelength Range (with external source)	1250–1570 nm
Display Resolution	0.0001 dB
Absolute PDL/PDG Uncertainty ^a	±0.005 dB +0/–2.5% of measured PDL (for PDL ≤0.2 dB) ±0.005 dB +0/–5% of measured PDL (for 0.2 dB < PDL ≤5 dB)
Absolute PDCR Uncertainty	±0.01 dB +0/–5% of measured PDCR (for PDCR ≤0.2 dB) ±0.01 dB +0/–10% of measured PDCR (for 0.2 dB < PDCR ≤5 dB)
Repeatability for PDL/PDG	±0.001 dB ±2% of measured PDL
Repeatability for PDCR	±0.002 dB ±4% of measured PDCR
PDL/PDG/PDCR Range ^b	0–5 dB
Maximum Insertion Loss of DUT ^c	20 dB

a. Applies to output connector Option 020 (pigtailed fiber port). For Option 021 (straight contact output connector) and

Option 022 (angled contact output connector), the PDL of the individual connector or connection may by far exceed the specified accuracy.

b. Higher PDL/PDG/PDCR values may be measured with increased uncertainty.

c. With higher insertion loss or source power < –10 dBm, PDL/PDG/PDCR values may be measured with increased uncertainty.

Supplementary Performance Characteristics

Supplementary performance characteristics provide information about non-warranted instrument performance in the form of nominal values, and are printed in italic typeface.

Return loss can be measured with internal source up to typically 55 dB with 1 dB accuracy.

General	
<i>Recalibration Period</i>	2 years
<i>Warm-up Time to meet accuracy specifications</i>	60 minutes for instrument, 5 minutes with laser on
<i>GPIB Capability</i>	all modes and parameters can be programmed, SCPI command set, Agilent 8153A lightwave multimeter compliant command set where applicable
<i>GPIB Interface Function Code</i>	SH1, AH1, T6, L4, SR1, RL1, PPO, DC1, DTO, CO
Environmental	
<i>Storage Temperature</i>	-40° C to +70° C
<i>Operating Temperature</i>	10° C to +40° C (35° C for Agilent 81525A)
<i>Humidity</i>	< 95% R.H. within operating temperature range
<i>Power</i>	100–240 Vrms, 100 VA max., 50–60 Hz
<i>Battery Back-up for non-volatile memory</i>	with instrument switched off, all current modes and data will be maintained for at least 10 years after delivery
<i>Dimensions</i>	8.9 cm H × 42.6 cm W × 44.5 cm D (3.5 in × 16.8 in × 17.5 in)
<i>Weight</i>	9 kg (19 lb)

Ordering Information

E5574A Optical Loss Analyzer

Fabry-Perot Laser Source (must select one option)

Option 013	1310 nm Built-in Laser Source
Option 015	1550 nm Built-in Laser Source
Option 135	Dual Wavelength (1310/1550 nm)
Option 521	Additional Agilent 81521B Option 100 Optical Head

Optical Output Connector (must select one option)

Option 020	Fiber Pigtail with FC/PC
Option 021	Straight Contact
Option 022	Angled Contact

Optical Heads

81521B	Ge, 900–1700 nm, +3 dBm to -80 dBm
Option 001	0.003 dB p-p Polarization Sensitivity
81524A	InGaAs, 800–1650 nm, +3 dBm to -90 dBm
81525A	InGaAs, 800–1650 nm, +27 dBm to -70 dBm

Appropriate connector interfaces and adapters should be ordered to allow connection to your device under test; refer to page 163.