

KEYSIGHT TECHNOLOGIES (AGILENT HP)

81640A

The Keysight (Agilent) 81640A is a Tunable Laser Source module designed for the 8164A and 8164B mainframes. Covering both the C- and L-bands from 1510 nm to 1640 nm, it is engineered for testing critical DWDM passive components. Key features include continuous sweep, low source spontaneous emission (SSE) output for high dynamic range measurements, and mode-hop free tuning over its entire wavelength range.

SPECIFICATIONS

General

Interfaces	Via mainframe backplane (GPIB, LAN, RS-232 on mainframe)
Display	None (uses mainframe display)

Physical

Power Supply	Provided via mainframe backplane
Operating Temperature	+10 °C to +35 °C °C
Dimensions (W×H×D)	325 mm × 75 mm × 235 mm mm
Weight	4.5 kg kg

Optical Specifications

Wavelength Range	1510 nm to 1640 nm
Wavelength Resolution	0.1 pm (12.5 MHz at 1550 nm)
Absolute Wavelength Accuracy	±15 pm (at constant temperature)
Relative Wavelength Accuracy	±5 pm
Wavelength Repeatability	±1 pm (typical ±0.5 pm)
Wavelength Stability	±1 pm (over 24 hours at constant temperature)
Tuning Speed (Continuous Sweep)	up to 40 nm/s
Max. Output Power (High Power Port)	>= +4 dBm (1510 nm to 1620 nm)
Max. Output Power (Low SSE Port)	>= 0 dBm (1510 nm to 1620 nm)
Power Resolution	0.01 dB
Power Flatness vs. Wavelength	±0.2 dB (typical ±0.1 dB)
Power Repeatability	±0.03 dB
Power Stability (1 Hour)	±0.01 dB (at constant temperature)
Power Stability (24 Hours)	±0.03 dB
Power Linearity	±0.05 dB
Spectral Linewidth (Coherence Control Off)	< 100 kHz (typical < 50 kHz)
Side Mode Suppression Ratio (SMSR)	>= 45 dB (typical 50 dB)
Signal-to-Source Spontaneous Emission (SSE) Ratio (High Power Port)	>= 55 dB/nm (1520 nm to 1620 nm)
Signal-to-Source Spontaneous Emission (SSE) Ratio (Low SSE Port)	>= 80 dB/nm (1520 nm to 1620 nm)

Polarization & Connectivity

Number of Optical Outputs	2 (Output 1: High Power, Output 2: Low SSE)
Output Fiber Type	Polarization Maintaining Fiber (PMF), Panda-type
Polarization Extinction Ratio (PER)	>= 18 dB
Polarization Alignment	Key aligned to slow axis
Connector Interface Options	Option 071 (PMF, straight contact), Option 072 (PMF, angled contact)

Modulation & Control

External Digital Modulation Frequency	300 Hz to 1 MHz
External Analog Modulation Frequency	300 Hz to 1 MHz
Internal Modulation Duty Cycle	50% (square wave)

Mainframe Compatibility

Compatible Mainframes	Keysight / Agilent 8164A, 8164B
Number of Slots Required	1 bottom slot (occupies both module widths in bottom bay)

Environmental & Standards	
Storage Temperature Range	-40 °C to +70 °C
Warm-up Time	1 hour
Laser Safety Class	Class 3B (IEC 60825-1) / Class IIIb (FDA 21 CFR 1040.10)

Power	
Absolute Power Accuracy	±0.5 dB (at calibration conditions)
Power Range (High Power Port)	-11 dBm to +6 dBm (1520 nm to 1620 nm)
Power Range (Low SSE Port)	-15 dBm to +2 dBm (1520 nm to 1620 nm)
Dynamic Power Flatness	±0.2 dB @ 10 nm/s (typical), ±0.5 dB @ 40 nm/s (typical)

Wavelength	
Internal Wavelength Reference	Built-in gas cell for real-time calibration
Sweep Modes	Continuous sweep, Step sweep
Wavelength Tuning Time	< 350 ms (for 1 nm step, typical)
Dynamic Wavelength Accuracy	+/-10 pm (at 10 nm/s continuous sweep, typical)

Optical Output	
Optical Return Loss	typically > 55 dB

Signal Quality	
Relative Intensity Noise (RIN)	<-145 dB/Hz (typical, at 10 MHz to 6 GHz)

TECHNOLOGY	
Tunable External Cavity Diode Laser (ECDL)	

APPLICATIONS	
DWDM passive component testing, optical amplifier testing, and spectral characterization	

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