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If you wish to buy or sell an Agilent/HP/Keysight Tunable Laser Sources (TLS), visit our catalog [here](#) to see our current stock.

Agilent/HP Large Module Tunable Laser Source (TLS) Calibration and Repair Services

With more than 20 years of expertise in repair of OSA, Tunable Lasers, Wavemeters and more, the quality of our services is renowned amongst the service centers community and highly appreciated by our partners and customers. We developed custom software allowing us to perform automatic calibration tests and write up to date results in the TLS calibration tables. Don't settle for a two-page summary assessment to trust that your TLS is operating per manufacturer specifications; our report contains the table of all results, confirming it has **really** been tested.

Agilent/HP 81xxx Large Tunable Laser Source (TLS) Repair and Calibration Services

The 81xxx series TLS goes through a premium calibration to ensure it meets or exceeds manufacturers published specifications. The equipment is shipped with a comprehensive 12 pages calibration certificate including a report with before-and-after data (9 pages) and a calibration sticker. A report from other labs with less data points reflects a not completely calibrated unit.

Simbol Test Systems is the only North America independent lab with the capability of realigning Agilent/HP TLS optical sections including the attenuator. If your unit does not pass calibration, we offer a fixed price repair fee and will get your TLS back to perfect working condition.

List of specifications calibrated (for units with low SSE capabilities)

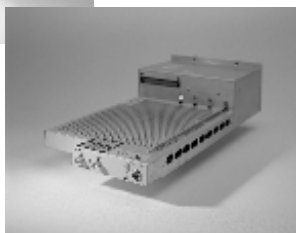
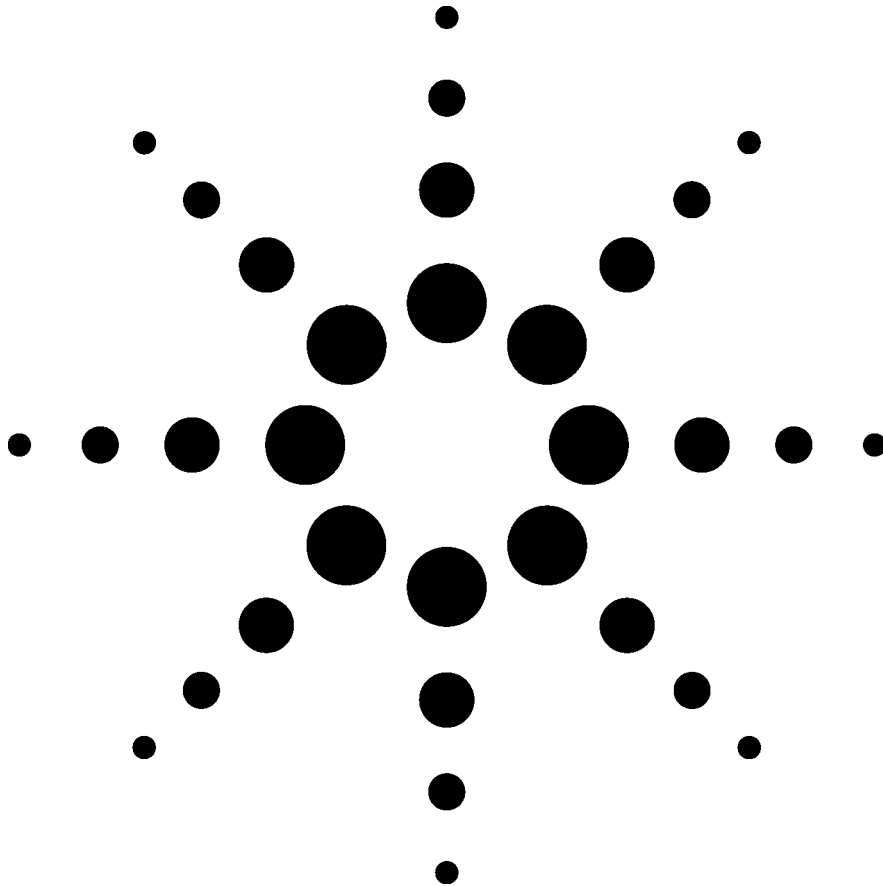
- Relative and Absolute Wavelength Accuracy
- Mode Hop Free Tuning
- Wavelength Repeatability
- Maximum Power Output 1 Low SSE
- Power Linearity Output 1 Low SSE
- Maximum Power Output 2 High Power
- Power Linearity Output 2 High Power
- Power Flatness Over Wavelength
- Power Stability
- Power Linearity Output 2 by Attenuator
- Signal-to-Source Spontaneous Emission Output 2 High Power
- Signal-to-Total-Source Spontaneous Emission Output 2 High Power
- Signal-to-Source Spontaneous Emission Output 1 Low SSE (if available on unit)
- Signal-to-Total-Source Spontaneous Emission Output 1 Low SSE

Traceability: Instrumentation used during this calibration is traceable to N.I.S.T (National Institute of Standards and Technology) or C.N.R.C. (Canadian National Research Council).

Agilent 81600B Tunable Laser Source Family

Technical Specifications

May 2003



The Agilent 81600B Tunable Laser Source Family offers the full wavelength range from 1260 nm to 1640 nm with the minimum number of lasers and no wavelength gaps. This provides test instrumentation with the maximum flexibility.

Investing in the Agilent 81600B Tunable Laser Source Family can realize the cost efficiency and performance required for both CWDM and DWDM component testing.



Agilent Technologies

Agilent 81600B Tunable Laser Source Family

The Agilent 81600B Tunable Laser Source Family consists of six products.

The 81600B option 200 All-band Tunable Laser Source is the flagship, featuring the widest tuning range of 200 nm with a single laser and a 70 dB/nm signal-to-source spontaneous emission ratio (signal-to-SSE ratio). The excellent low-SSE performance typically allows cross-talk measurements of better than 70 dB for an 8 channel CWDM multiplexer.

The 81600B option 160, 150 and 140 Tunable Laser Sources offer other wavelength ranges and are equipped with two optical outputs, like the option 200. By selecting the port, high power or low-SSE can be obtained.

The 81600B option 142 and 132 Tunable Laser Sources have a single high power output port. The 81600B option 132 covers the wavelength range from 1260 nm to 1375 nm.

These six modules fit into the bottom slot of the Agilent 8164B Lightwave Solution Mainframe.

Full wavelength range from 1260 nm to 1640 nm with the minimum number of lasers

The Agilent 81600B Tunable Laser Source Family offers the full wavelength range from 1260 nm to 1640 nm with the minimum numbers of lasers and no wavelength gaps.

This provides test instrumentation with the maximum flexibility.

Realize the cost efficiency and performance benefits in WDM component tests

The testing of optical filters is based on a generic principle, namely the stimulus-response test. The state-of-the-art approach is a wavelength-resolved stimulus-response measurement utilizing a tunable laser source that is capable of fast and precise sweeps across the entire wavelength range, and optical power meters.

For DWDM components, high wavelength accuracy and dynamic range are critical. For CWDM components, a wide wavelength range, dynamic range and tight costing are key targets. If the investment in the test solution can be shared among many different type of filters, the contribution to each individual filter is minimized. In this way, cost targets for CWDM components can be met without sacrificing accuracy.

Investing in the Agilent 81600B Tunable Laser Source Family can realize both the cost efficiency and performance benefits required.

Specified performance in the continuous sweep mode

As manufacturing yield expectations becomes more and more stringent, it is important that all instruments deliver optimum performance under all measurement conditions.

The Agilent 81600B Tunable Laser Source Family can sweep as fast as 80 nm/s with specified accuracy during the sweep.

Low SSE output port for high dynamic range

The low-SSE output port delivers a signal with ultra-low source spontaneous emission. It enables accurate cross-talk measurement of DWDM and CWDM wavelength filtering components by producing light only at the desired wavelength.

The second output port provides high optical power, adjustable over a power range of more than 60 dB via a built-in optical attenuator.

High Power output for multi-purpose component tests

The Agilent 81600B options 142 and 132 simply provide the output port with high stimulus power for applications where the SSE level is not critical.

The 81600B option 142 can also be equipped with a built-in optical attenuator, so providing an adjustable power range of 60 dB.

Built-in wavelength meter for the optimum tuning precision

The Agilent 81600B Tunable Laser Source Family includes a built-in real time wavelength meter which realizes an absolute wavelength accuracy of ± 10 pm (typ. ± 2.5 pm) as a stand-alone instrument.

Polarization Maintaining Fiber for the test of integrated optical devices

The 81600B Tunable Laser Source Family is ideal for characterizing integrated optical devices. Its PMF output ports provide a well-defined state of polarization to ensure constant measurement conditions for waveguide devices. A PMF cable easily connects to an external optical modulator.

81600B opt. 200 All-Band Tunable Laser Source, 1440 nm - 1660 nm, low SSE

		Agilent 81600B opt.200			2.0
Wavelength range	1440 nm to 1640 nm				
Wavelength resolution	0.1 pm, 12.5 MHz at 1550 nm				
Mode-hop free tunability	full wavelength range				
Maximum sweep speed	80 nm/s				
	Stepped mode	Continuous sweep mode (typ.)			
		at 5 nm/s	at 40 nm/s	at 80 nm/s	
Absolute wavelength accuracy	± 10 pm ^[1] , typ. ± 2.5 pm	± 2.9 pm	± 3.5 pm	± 5.0 pm	
Relative wavelength accuracy ^[1]	± 5 pm, typ. ± 2 pm	± 2.4 pm	± 2.8 pm	± 4.0 pm	
Wavelength repeatability	± 0.8 pm, typ. ± 0.5 pm				
Dynamic wavelength repeatability (typ.)		± 0.3 pm	± 0.4 pm	± 0.7 pm	
Wavelength stability (typ., over 24 h at constant temperature)	$\leq \pm 1$ pm				
Linewidth (typ.), coherence control off	100 kHz				
Effective linewidth (typ.), coherence ctrl. on	> 50 MHz (1475 nm – 1625 nm, at constant output power)				
	Output 1 (low SSE)		Output 2 (high power)		
Maximum output power (continuous power during tuning)	$\geq +3$ dBm peak (typ.) $\geq +2$ dBm (1520 nm – 1610 nm) ≥ -2 dBm (1475 nm – 1625 nm) ≥ -7 dBm (1440 nm – 1640 nm)		$\geq +9$ dBm peak (typ.) $\geq +8$ dBm (1520 nm – 1610 nm) $\geq +4$ dBm (1475 nm – 1625 nm) ≥ -1 dBm (1440 nm – 1640 nm)		
Attenuation			60 dB		
Power repeatability (typ.)	± 0.003 dB				
Power stability	± 0.01 dB, 1 hour typ. ± 0.03 dB, 24 hours				
Power linearity	± 0.1 dB		± 0.1 dB (± 0.3 dB in attenuation mode)		
Power flatness versus wavelength	± 0.25 dB ^[3] , typ. ± 0.1 dB		± 0.3 dB ^[3] , typ. ± 0.15 dB		
		Continuous sweep mode			
		at 5 nm/s	at 40 nm/s	at 80 nm/s	
Dynamic power reproducibility (typ.)		± 0.005 dB	± 0.01 dB	± 0.015 dB	
Dynamic relative power flatness (typ.)		± 0.01 dB	± 0.02 dB	± 0.04 dB	
Side-mode suppression ratio (typ.) ^[2]	≥ 60 dB (1520 nm – 1610 nm)				
	Output 1 (low SSE)		Output 2 (high power)		
Signal to source spontaneous emission ratio ^[2]	≥ 70 dB/nm (1520 nm – 1610 nm) typ. 80 dB/0.1nm (1520 nm – 1610 nm) ≥ 66 dB/nm (typ., 1475 nm – 1625 nm) ≥ 60 dB/nm (typ., 1440 nm – 1640 nm)		≥ 48 dB/nm (1520 nm – 1610 nm) typ. 58 dB/0.1nm (1520 nm – 1610 nm) ≥ 43 dB/nm (1475 nm – 1625 nm) ≥ 37 dB/nm (1440 nm – 1640 nm)		
Signal to total source spontaneous emission ratio ^[2]	≥ 65 dB (1520 nm – 1610 nm) ≥ 57 dB (typ., 1440 nm – 1640 nm)		≥ 30 dB (typ., 1520 nm – 1610 nm)		
Relative intensity noise (RIN) (typ.) ^[2]	-145 dB/Hz (1520 nm – 1610 nm)				

[1] Valid for one month and within a ± 4.4 K temperature range after automatic wavelength zeroing.

[2] At maximum output power as specified per wavelength range.

[3] Wavelength range 1440 nm – 1630 nm.

81600B opt. 160 Tunable Laser Source, 1495 nm - 1640 nm, low SSE

		Agilent 81600B opt.160			2.0
Wavelength range	1495 nm to 1640 nm				
Wavelength resolution	0.1 pm, 12.5 MHz at 1550 nm				
Mode-hop free tunability	full wavelength range				
Maximum sweep speed	80 nm/s				
	Stepped mode	Continuous sweep mode (typ.)			
		at 5 nm/s	at 40 nm/s	at 80 nm/s	
Absolute wavelength accuracy	± 10 pm ^[1] , typ. ± 2.5 pm	± 2.9 pm	± 3.5 pm	± 5.0 pm	
Relative wavelength accuracy ^[1]	± 5 pm, typ. ± 2 pm	± 2.4 pm	± 2.8 pm	± 4.0 pm	
Wavelength repeatability	± 0.8 pm, typ. ± 0.5 pm				
Dynamic wavelength repeatability (typ.)		± 0.3 pm	± 0.4 pm	± 0.7 pm	
Wavelength stability (typ., over 24 h at constant temperature)	$\leq \pm 1$ pm				
Linewidth (typ.), coherence control off	100 kHz				
Effective linewidth (typ.), coherence ctrl. on	> 50 MHz (1510 nm – 1620 nm, at constant output power)				
	Output 1 (low SSE)		Output 2 (high power)		
Maximum output power (continuous power during tuning)	≥ -2 dBm peak (typ.) ≥ -4 dBm (1520 nm – 1610 nm) ≥ -6 dBm (1510 nm – 1620 nm) ≥ -7 dBm (1495 nm – 1640 nm)		$\geq +7$ dBm peak (typ.) $\geq +5$ dBm (1520 nm – 1610 nm) $\geq +3$ dBm (1510 nm – 1620 nm) ≥ -1 dBm (1495 nm – 1640 nm)		
Power repeatability (typ.)	± 0.003 dB				
Power stability	± 0.01 dB, 1 hour typ. ± 0.03 dB, 24 hours				
Power linearity	± 0.1 dB		± 0.3 dB		
Power flatness versus wavelength	± 0.25 dB, typ. ± 0.1 dB (1495nm – 1630nm)		± 0.3 dB, typ. ± 0.15 dB		
		Continuous sweep mode			
		at 5 nm/s	at 40 nm/s	at 80 nm/s	
Dynamic power reproducibility (typ.)		± 0.005 dB	± 0.01 dB	± 0.015 dB	
Dynamic relative power flatness (typ.)		± 0.01 dB	± 0.015 dB	± 0.03 dB	
Side-mode suppression ratio (typ.) ^[2]	≥ 40 dB (1520 nm – 1610 nm)				
	Output 1 (low SSE)		Output 2 (high power)		
Signal to source spontaneous emission ratio ^[2]	≥ 64 dB/nm (1520 nm – 1610 nm) typ. 74 dB/0.1nm (1520 nm – 1610 nm) ≥ 62 dB/nm (typ., 1510 nm – 1620 nm) ≥ 59 dB/nm (typ., 1495 nm – 1640 nm)		≥ 45 dB/nm (1520 nm – 1610 nm) typ. 55 dB/0.1nm (1520 nm – 1610 nm) ≥ 42 dB/nm (1510 nm – 1620 nm) ≥ 37 dB/nm (1495 nm – 1640 nm)		
Signal to total source spontaneous emission ratio ^[2]	≥ 59 dB (1520 nm – 1610 nm) ≥ 56 dB (typ., 1495 nm – 1640 nm)		≥ 27 dB (typ., 1520 nm – 1610 nm)		
Relative intensity noise (RIN) (typ.) ^[2]	-145 dB/Hz (1520 nm – 1610 nm)				

[1] Valid for one month and within a ± 4.4 K temperature range after automatic wavelength zeroing.

[2] At maximum output power as specified per wavelength range.

81600B opt. 150 Tunable Laser Source, 1460 nm - 1580 nm, low SSE

		Agilent 81600B opt.150			2.0
Wavelength range	1450 nm to 1590 nm				
Wavelength resolution	0.1 pm, 12.5 MHz at 1550 nm				
Mode-hop free tunability	full wavelength range				
Maximum sweep speed	80 nm/s				
	Stepped mode	Continuous sweep mode (typ.)			
		at 5 nm/s	at 40 nm/s	at 80 nm/s	
Absolute wavelength accuracy	± 10 pm ^[1] , typ. ± 2.5 pm	± 2.9 pm	± 3.5 pm	± 5.0 pm	
Relative wavelength accuracy ^[1]	± 5 pm, typ. ± 2 pm	± 2.4 pm	± 2.8 pm	± 4.0 pm	
Wavelength repeatability	± 0.8 pm, typ. ± 0.5 pm				
Dynamic wavelength repeatability (typ.)		± 0.3 pm	± 0.4 pm	± 0.7 pm	
Wavelength stability (typ., over 24 h at constant temperature)	$\leq \pm 1$ pm				
Linewidth (typ.), coherence control off	100 kHz				
Effective linewidth (typ.), coherence ctrl. on	> 50 MHz (1480 nm – 1580 nm, at constant output power)				
	Output 1 (low SSE)		Output 2 (high power)		
Maximum output power (continuous power during tuning)	≥ -1 dBm peak (typ.) ≥ -3 dBm (1520 nm – 1570 nm) ≥ -6 dBm (1480 nm – 1580 nm) ≥ -7 dBm (1450 nm – 1590 nm)		$\geq +7$ dBm peak (typ.) $\geq +5$ dBm (1520 nm – 1570 nm) $\geq +4$ dBm (1480 nm – 1580 nm) ≥ -1 dBm (1450 nm – 1590 nm)		
Power repeatability (typ.)	± 0.003 dB				
Power stability	± 0.01 dB, 1 hour typ. ± 0.03 dB, 24 hours				
Power linearity	± 0.1 dB		± 0.3 dB		
Power flatness versus wavelength	± 0.2 dB, typ. ± 0.1 dB		± 0.3 dB, typ. ± 0.15 dB		
		Continuous sweep mode			
		at 5 nm/s	at 40 nm/s	at 80 nm/s	
Dynamic power reproducibility (typ.)		± 0.005 dB	± 0.01 dB	± 0.015 dB	
Dynamic relative power flatness (typ.)		± 0.01 dB	± 0.15 dB	± 0.03 dB	
Side-mode suppression ratio (typ.) ^[2]	≥ 40 dB (1480 nm – 1580 nm)				
	Output 1 (low SSE)		Output 2 (high power)		
Signal to source spontaneous emission ratio ^[2]	≥ 65 dB/nm (1520 nm – 1570 nm) typ. 75 dB/0.1nm (1520 nm – 1570 nm) ≥ 61 dB/nm (typ., 1480 nm – 1580 nm) ≥ 59 dB/nm (typ., 1450 nm – 1590 nm)		≥ 45 dB/nm (1520 nm – 1570 nm) typ. 55 dB/0.1nm (1520 nm – 1570 nm) ≥ 42 dB/nm (1480 nm – 1580 nm) ≥ 37 dB/nm (1450 nm – 1590 nm)		
Signal to total source spontaneous emission ratio ^[2]	≥ 60 dB (1520 nm – 1570 nm) ≥ 50 dB (typ., 1450 nm – 1590 nm)		≥ 30 dB (typ., 1520 nm – 1570 nm)		
Relative intensity noise (RIN) (typ.) ^[2]	-145 dB/Hz (1480 nm – 1580 nm)				

[1] Valid for one month and within a ± 4.4 K temperature range after automatic wavelength zeroing.

[2] At maximum output power as specified per wavelength range.

81600B opt. 140 Tunable Laser Source, 1370 nm - 1495 nm, low SSE

		Agilent 81600B opt.140			2.0
Wavelength range	1370 nm to 1495 nm				
Wavelength resolution	0.1 pm, 15 MHz at 1450 nm				
Mode-hop free tunability	full wavelength range				
Maximum sweep speed	80 nm/s (1372 nm – 1495 nm)				
	Stepped mode	Continuous sweep mode (typ.)			
		at 5 nm/s	at 40 nm/s	at 80 nm/s	
Absolute wavelength accuracy	± 10 pm ^[1] , typ. ± 2.5 pm	± 2.9 pm	± 3.5 pm	± 5.0 pm	
Relative wavelength accuracy ^[1]	± 5 pm, typ. ± 2 pm	± 2.4 pm	± 2.8 pm	± 4.0 pm	
Wavelength repeatability	± 0.8 pm, typ. ± 0.5 pm				
Dynamic wavelength repeatability (typ.)		± 0.3 pm	± 0.4 pm	± 0.7 pm	
Wavelength stability (typ., over 24 h at constant temperature)	$\leq \pm 1$ pm				
Linewidth (typ.), coherence control off	100 kHz				
Effective linewidth (typ.), coherence ctrl. on	> 50 MHz (1430 nm – 1480 nm, at constant output power)				
	Output 1 (low SSE)		Output 2 (high power)		
Maximum output power (continuous power during tuning)	≥ -4.5 dBm peak (typ.) ≥ -5 dBm (1430 nm – 1480 nm) ≥ -7 dBm (1420 nm – 1480 nm) ≥ -13 dBm (1370 nm – 1495 nm)		$\geq +5.5$ dBm peak (typ.) $\geq +5$ dBm (1430 nm – 1480 nm) $\geq +3$ dBm (1420 nm – 1480 nm) ≥ -3 dBm (1370 nm – 1495 nm)		
Power repeatability (typ.)	± 0.003 dB				
Power stability	± 0.01 dB 1 hour (1420 nm – 1495 nm) typ. ± 0.01 dB, 1 hour (1370 nm – 1420 nm) typ. ± 0.03 dB, 24 hours				
Power linearity	± 0.1 dB (1420 nm – 1495nm) typ. ± 0.1 dB, (1370 nm – 1420 nm)		± 0.3 dB (1420 nm – 1495 nm) typ. ± 0.3 dB, (1370 nm – 1420 nm)		
Power flatness versus wavelength	± 0.2 dB, typ. ± 0.1 dB (1420 nm – 1495 nm) typ. ± 0.2 dB (1370 nm – 1420 nm)		± 0.3 dB, typ. ± 0.2 dB (1420 nm – 1495 nm) typ. ± 0.3 dB (1370 nm – 1420 nm)		
		Continuous sweep mode ^[3]			
		at 5 nm/s	at 40 nm/s	at 80 nm/s	
Dynamic power reproducibility (typ.)		± 0.005 dB	± 0.01 dB	± 0.015 dB	
Dynamic relative power flatness (typ.)		± 0.01 dB	± 0.015 dB	± 0.03 dB	
Side-mode suppression ratio (typ.) ^[2]	≥ 40 dB (1430 nm – 1480 nm)				
	Output 1 (low SSE)		Output 2 (high power)		
Signal to source spontaneous emission ratio ^[2]	≥ 63 dB/nm (1430 nm – 1480 nm) typ. 73 dB/0.1nm (1430 nm – 1480 nm) ≥ 58 dB/nm (1420 nm – 1480 nm) ≥ 53 dB/nm (typ., 1370 nm – 1495 nm)		≥ 42 dB/nm (1430 nm – 1480 nm) typ. 52 dB/0.1nm (1430 nm – 1480 nm) ≥ 40 dB/nm (1420 nm – 1480 nm) ≥ 35 dB/nm (typ., 1370 nm – 1495 nm)		
Signal to total source spontaneous emission ratio ^[2]	≥ 60 dB (1430 nm – 1480 nm) ≥ 58 dB (1420 nm – 1480 nm) ≥ 53 dB (typ., 1370 nm – 1495 nm)		≥ 28 dB (typ., 1430 nm – 1480 nm)		
Relative intensity noise (RIN) (typ.) ^[2]	-145 dB/Hz (1430 nm – 1480 nm)				

[1] Valid for one month and within a ± 4.4 K temperature range after automatic wavelength zeroing.

[2] At maximum output power as specified per wavelength range.

[3] Valid for absolute humidity of 11.5 g/m^3 (For example, equivalent to 50% relative humidity at 25°C).

81600B opt. 142 Tunable Laser Source, 1370 nm - 1495 nm, high power

		Agilent 81600B opt.142			2.0
Wavelength range	1370 nm to 1495 nm				
Wavelength resolution	0.1 pm, 15 MHz at 1450 nm				
Mode-hop free tunability	full wavelength range				
Maximum sweep speed	80 nm/s (1372 nm – 1495 nm)				
	Stepped mode	Continuous sweep mode (typ.)			
		at 5 nm/s	at 40 nm/s	at 80 nm/s	
Absolute wavelength accuracy	± 10 pm ^[1] , typ. ± 2.5 pm	± 2.9 pm	± 3.5 pm	± 5.0 pm	
Relative wavelength accuracy ^[1]	± 5 pm, typ. ± 2 pm	± 2.4 pm	± 2.8 pm	± 4.0 pm	
Wavelength repeatability	± 0.8 pm, typ. ± 0.5 pm				
Dynamic wavelength repeatability (typ.)		± 0.3 pm	± 0.4 pm	± 0.7 pm	
Wavelength stability (typ., over 24 h at constant temperature)	$\leq \pm 1$ pm				
Linewidth (typ.), coherence control off	100 kHz				
Effective linewidth (typ.), coherence ctrl. on	> 50 MHz (1430 nm – 1480 nm, at flat output power)				
Maximum output power (continuous power during tuning)	$\geq +8.5$ dBm peak (typ.) $\geq +7.5$ dBm (1430 nm – 1480 nm) $\geq +5$ dBm (1420 nm – 1480 nm) ≥ 0 dBm (1370 nm – 1495 nm) Reduce by 1.5 dB.				
With option 003					
Power repeatability (typ.)	± 0.003 dB				
Power stability	± 0.01 dB, 1 hour (1420 nm – 1495 nm) typ. ± 0.01 dB, 1 hour (1370 nm – 1420 nm) typ. ± 0.03 dB, 24 hours				
Power linearity	± 0.1 dB (1420 nm – 1495 nm) typ. ± 0.1 dB (1370 nm – 1420 nm)				
With option 003	Add ± 0.2 dB				
Power flatness versus wavelength	± 0.2 dB, typ. ± 0.1 dB (1420 nm – 1495 nm) typ. ± 0.2 dB (1370 nm – 1420 nm)				
With option 003	Add ± 0.1 dB				
		Continuous sweep mode ^[3]			
		at 5 nm/s	at 40 nm/s	at 80 nm/s	
Dynamic power reproducibility (typ.)		± 0.005 dB	± 0.01 dB	± 0.015 dB	
Dynamic relative power flatness (typ.)		± 0.01 dB	± 0.015 dB	± 0.03 dB	
Side-mode suppression ratio (typ.) ^[2]	≥ 40 dB (1430 nm – 1480 nm)				
Signal to source spontaneous emission ratio ^[2]	≥ 42 dB/nm (1430 nm – 1480 nm) typ. 52 dB/0.1 nm (1430 nm – 1480 nm) ≥ 40 dB/nm (1420 nm – 1480 nm) ≥ 35 dB/nm (typ., 1370 nm – 1495 nm)				
Signal to total source spontaneous emission ratio ^[2]	≥ 28 dB (1430 nm – 1480 nm)				
Relative intensity noise (RIN) (typ.) ^[2]	–145 dB/Hz (1430 nm – 1480 nm)				

[1] Valid for one month and within a ± 4.4 K temperature range after automatic wavelength zeroing.

[2] At maximum output power as specified per wavelength range.

[3] Valid for absolute humidity of 11.5 g/m^3 (For example, equivalent to 50% relative humidity at 25°C).

81600B opt. 132 Tunable Laser Source, 1260 nm - 1375 nm, high power

		Agilent 81600B opt.132			2.0
Wavelength range	1260 nm to 1375 nm				
Wavelength resolution	0.1 pm, 17.7 MHz at 1300 nm				
Mode-hop free tunability	full wavelength range				
Maximum sweep speed	80 nm/s				
	Stepped mode	Continuous sweep mode (typ.)			
		at 5 nm/s	at 40 nm/s	at 80 nm/s	
Absolute wavelength accuracy	±10 pm ^[1] , typ. ±2.5 pm	±2.9 pm	±3.5 pm	±5.0 pm	
Relative wavelength accuracy ^[1]	±5 pm, typ. ±2 pm	±2.4 pm	±2.8 pm	±4.0 pm	
Wavelength repeatability	±0.8 pm, typ. ±0.5 pm				
Dynamic wavelength repeatability (typ.)		±0.3 pm	±0.4 pm	±0.7 pm	
Wavelength stability (typ., over 24 h at constant temperature)	≤ ±1 pm				
Linewidth (typ.), coherence control off	100 kHz				
Effective linewidth (typ.), coherence ctrl. on	> 50 MHz (1270 nm – 1350 nm, at flat output power)				
Maximum output power (continuous power during tuning)	≥ +9 dBm peak (typ.) ≥ +7 dBm (1290 nm – 1370 nm) ≥ +3 dBm (1270 nm – 1375 nm) ≥ 0 dBm (1260 nm – 1375 nm)				
Power repeatability (typ.)	±0.003 dB				
Power stability	±0.01 dB, 1 hour (1260 nm – 1350 nm) typ. ±0.01 dB, 1 hour (1350 nm – 1375 nm) typ. ±0.03 dB, 24 hours				
Power linearity	±0.1 dB (1260 nm – 1350 nm) typ. ±0.1 dB (1350 nm – 1375 nm)				
Power flatness versus wavelength	±0.2 dB, typ. ±0.1 dB (1260 nm – 1350 nm) typ. ±0.2 dB (1350 nm – 1375 nm)				
		Continuous sweep mode ^[3]			
		at 5 nm/s	at 40 nm/s	at 80 nm/s	
Dynamic power reproducibility (typ.)		±0.005 dB	±0.01 dB	±0.015 dB	
Dynamic relative power flatness (typ.)		±0.01 dB	±0.015 dB	±0.03 dB	
Side-mode suppression ratio (typ.) ^[2]	≥ 40 dB (1270 nm – 1375 nm)				
Signal to source spontaneous emission ratio ^[2]	≥ 45 dB/nm (1290 nm – 1370 nm) typ. 55 dB/0.1 nm (1290 nm – 1370 nm) ≥ 40 dB/nm (1270 nm – 1375 nm) ≥ 35 dB/nm (typ., 1260 nm – 1375 nm)				
Signal to total source spontaneous emission ratio ^[2]	≥ 28 dB (1290 nm – 1370 nm)				
Relative intensity noise (RIN) (typ.) ^[2]	–145 dB/Hz (1270 nm – 1375 nm)				

[1] Valid for one month and within a ±4.4 K temperature range after automatic wavelength zeroing.

[2] At maximum output power as specified per wavelength range.

[3] Valid for absolute humidity of 11.5 g/m³ (For example, equivalent to 50% relative humidity at 25°C).

Conditions

Storage temperature:

– 40 °C to + 70 °C

Operating temperature:

10 °C to 35 °C

Humidity:

< 80 % R.H. at 10 °C to 35 °C non-condensing.

Wavelength not equal to any water absorption line

Warm-up time:

1 h

immediate operation after boot up

Output power:

Specifications are valid at the following output power levels:

81600B option 200/160 and 150:

≥ – 7 dBm (for Output 1)

≥ – 1 dBm (for Output 2, attenuation 0 dB).

81600B option 140:

≥ – 13 dBm (for Output 1)

≥ – 3 dBm (for Output 2).

81600B option 142:

≥ – 3 dBm

≥ – 4.5 dBm (With option 003).

81600B option 132:

≥ 0 dBm

Continuous sweep mode:

Specifications are valid for mode-hop free sweeping.

Maximum 50 nm at constant output power levels as follows:

81600B option 200:

1475 nm – 1620 nm

≥ – 2 dBm (for Output 1)

≥ + 4 dBm (for Output 2).

81600B option 160:

1510 nm – 1620 nm

≥ – 6 dBm (for Output 1)

≥ + 3 dBm (for Output 2).

81600B option 150:

1520 nm – 1570 nm

≥ – 6 dBm (for Output 1)

≥ + 3 dBm (for Output 2).

81600B option 140:

1430 nm – 1480 nm

≥ – 9 dBm (for Output 1)

≥ 0 dBm (for Output 2).

81600B option 142:

1430 nm – 1480 nm

≥ – 3 dBm

≥ 1.5 dBm (With Option 003).

81600B option 132:

1300 nm – 1350 nm

≥ + 3 dBm

Operating temperature within

+ 20 °C and + 35 °C

Supplementary performance characteristics

Internal digital modulation

50% duty cycle, 200 Hz to 300 kHz.

Displayed wavelength represents average wavelength.

Modulation output:

TTL reference signal.

External digital modulation

> 45% duty cycle, fall time

< 300 ns, 200 Hz to 1 MHz.

Displayed wavelength represents average wavelength.

Modulation input:

TTL signal.

External analog modulation

≥ ±15% modulation depth,

5 kHz to 20 MHz

Modulation input:

5 Vp-p

External wavelength locking

> ±70 pm at 10 Hz

> ±7 pm at 100 Hz.

Modulation input:

± 5 V

Coherence control:

For measurements on components with 2 m long patchcords and connectors with 14 dB return loss, the effective linewidth results in a typical power stability of < ±0.025 dB over 1 minute by drastically reducing interference effects in the test setup.

General

Output isolation (typ.):

50 dB.

Return loss (typ.):

60 dB (options 072);

40 dB (options 071).

Polarization maintaining fiber

(Option 071, 072)

Fiber type:

Panda.

Orientation:

TE mode in slow axis, in line with connector key.

Polarization Extinction ratio:

16 dB typ.

14 dB typ. (Option 200)

Recommended re-calibration period:

2 years.

Ordering Information

Lightwave Solution Mainframe: 8164B

Tunable Laser Module: 81600B

One of the following is required:

Option 200 All-band Tunable Laser Source
1440 nm to 1640 nm, low SSE

Option 160 Tunable Laser Source
1495 nm to 1640 nm, low SSE

Option 150 Tunable Laser Source
1455 nm to 1590 nm, low SSE

Option 140 Tunable Laser Source
1370 nm to 1495 nm, low SSE

Option 142 Tunable Laser Source
1370 nm to 1495 nm, high power

Option 132 Tunable Laser Source
1260 nm to 1375 nm, high power

Connector Option:

One of the following is required:

Option 071: PMF, straight contact output connector.

Option 072: PMF, angled contact output connector.

Other Option:

Option 003: Built-in optical attenuator, 60 dB attenuation
(for Option 142).

Connector Interface:

One Agilent 81000xl-series connector interface is required for Options 142 and 132.

Two Agilent 81000xl-series connector interfaces are required for Options 200, 160, 150, and 140.

TLS Upgrade option:

Upgrade an Agilent tunable laser source to the latest 81600B Family product.

Choose one option from #UG1 to #UG4 with the 81600B:

	81600B #200	81600B #160	81600B #150	81600B #140	81600B #142	81600B #132
81640A/B	#UG1	#UG3				#UG2
81680A/B						
81480A/B						
81642A/B		#UG4			#UG3	
81682A/B						
81482B						

For details, please visit www.tunablelaserupgrades.com

Custom-made TLS:

A 1650 nm Tunable Laser Source, and a 1300 nm Tunable Laser Source with low-SSE output, are available on request.

Please contact your local Agilent Sales Office.

Laser Safety Information

All laser sources specified by this data sheet are classified as Class 1M according to IEC 60825-1 (2001).

All laser sources comply with 21 CFR 1040.10 except for deviations pursuant to Laser Notice No. 50, dated 2001-July-26.



Agilent Technologies' Test and Measurement Support, Services, and Assistance

Agilent Technologies aims to maximize the value you receive, while minimizing your risk and problems. We strive to ensure that you get the test and measurement capabilities you paid for and obtain the support you need. Our extensive support resources and services can help you choose the right Agilent products for your applications and apply them successfully. Every instrument and system we sell has a global warranty. Support is available for at least five years beyond the production life of the product. Two concepts underlie Agilent's overall support policy: "Our Promise" and "Your Advantage."

Our Promise

Our Promise means your Agilent test and measurement equipment will meet its advertised performance and functionality. When you are choosing new equipment, we will help you with product information, including realistic performance specifications and practical recommendations from experienced test engineers. When you use Agilent equipment, we can verify that it works properly, help with product operation, and provide basic measurement assistance for the use of specified capabilities, at no extra cost upon request. Many self-help tools are available.

Your Advantage

Your Advantage means that Agilent offers a wide range of additional expert test and measurement services, which you can purchase according to your unique technical and business needs. Solve problems efficiently and gain a competitive edge by contracting with us for calibration, extra-cost upgrades, out-of-warranty repairs, and on-site education and training, as well as design, system integration, project management, and other professional engineering services. Experienced Agilent engineers and technicians worldwide can help you maximize your productivity, optimize the return on investment of your Agilent instruments and systems, and obtain dependable measurement accuracy for the life of those products.

By internet, phone, or fax, get assistance with all your test & measurement needs

Online assistance:

www.agilent.com/comms/lightwave

Phone or Fax

United States:

(tel) 1 800 452 4844

Canada:

(tel) 1 877 894 4414

(fax) (905) 282-4120

Europe:

(tel) (31 20) 547 2323

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Japan:

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New Zealand:

(tel) 0 800 738 378

(fax) 64 4 495 8950

Asia Pacific:

(tel) (852) 3197 7777

(fax) (852) 2506 9284

Related Agilent Literature

Agilent 8163B Lightwave Multimeter

Agilent 8164B Lightwave Measurement System

Agilent 8166B Lightwave Multichannel System

Technical Specifications

p/n 5988-3924EN

Agilent 81662A DFB Laser

Agilent 816623A DFB Laser

Agilent Fabry Perot Laser

Technical Specifications

p/n 5988-1570EN

Agilent Power Sensor Modules

Agilent Optical Heads

Agilent Return loss Modules

Technical Specifications

p/n 5988-1569EN

Agilent 8163A/B Lightwave Multimeter

Agilent 8164A/B Lightwave Measurement System

Agilent 8166A/B Lightwave Multichannel System

Configuration Guide

p/n 5988-1571EN

Agilent 81689A/B, 81689B, & 81649A

Compact Tunable Laser Modules

Technical Specifications

p/n 5988-3675EN

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