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Simbol Test Systems is the one-stop shop for all your fiber optic test equipment and measurement needs. As we are exclusively focused on e-commerce and international distribution of photonic products since 2000, our customers rely on the [AssetRelay](#) catalog to find our stock listings of thousands of used and refurbished popular test equipment. They know they can get repair, customization and calibration services from our laboratory for their own fiber optic instruments from all renowned brand manufacturers.

If you wish to buy or sell a 81640B or any model of HP, Agilent, Keysight TLS (Tunable Laser Source), visit our catalog [here](#) to see our current stock with actual photos. Other brands also available and likely cheaper.

The Simbol Test Systems expertise

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 to cover the entire band of your TLS. Don't settle for a two-page summary assessment to trust that your **TLS** is operating through its full range at full power; our report contains the complete table of all results, confirming it has **really** been tested. A report from other labs with less data points reflects a not completely calibrated unit. So be careful of other sellers saying their equipment is "tested good", "powered on, self-tested", "pulled from a working environment". When you choose AssetRelay, you can be confident that we actually test everything we sell so you know it will work when it gets to your workplace.

Agilent/HP/Keysight 81640B Tunable Laser Source (TLS) Repair and Calibration Services

The 81640B TLS goes through a premium calibration to ensure it meets or exceeds manufacturer's published specifications. The equipment is shipped with a comprehensive 12 page calibration certificate including a report with complete 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.

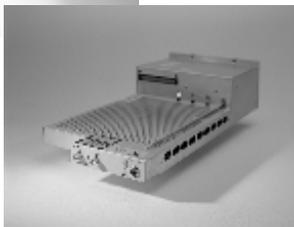
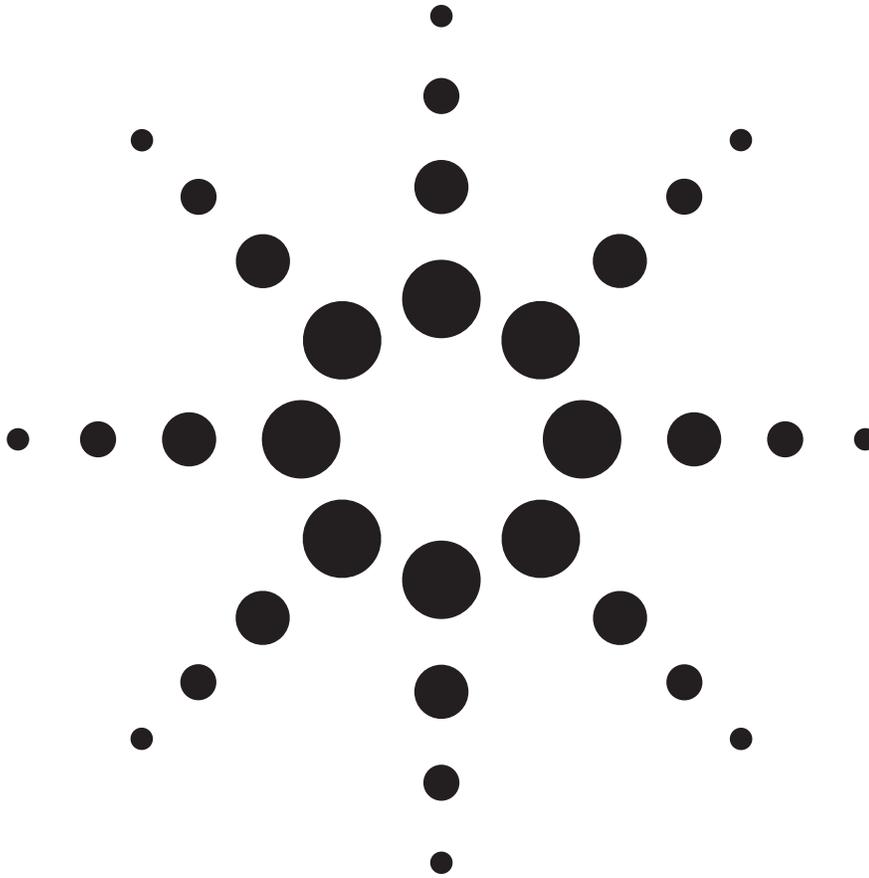
List of specifications calibrated

- 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
- 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 81480/ 680/ 640B
Agilent 81672/ 482/ 682/ 642B
Tunable Laser Sources
Technical Specifications
March 2002**

This is an edited version of the Agilent specifications focusing on the 81640B



The 81672B, 81480B/482B, 81680B/682B, 81640B/642B Tunable Laser Sources offer the minimum number of lasers for the maximum flexibility to reduce the test cost, and have specifications at the fast tuning speed which gives the minimum uncertainty at the highest throughput.



Agilent Technologies

Minimum number of lasers for the maximum flexibility to reduce the test cost

The Agilent 81672B, 81480B/482B, 81680B/682B and 81640B/642B modules offer the complete wavelength range from 1260 nm to 1640 nm with the minimum numbers of lasers without any wavelength gap, so that customers can get the maximum flexibility in their test set up.

Optimum performance under the fast swept conditions to ensure the minimum uncertainty at the highest throughput

As manufacturing yield becomes more and more stringent, it is important that all instruments have the optimum performance under all measurement conditions. To ensure maximum instrument performance even under the fastest swept conditions, the Agilent 81672B, 81480B/482B, 81680B/682B and 81640B/642B modules are specified over the full range of tuning speed. Thus leading to the minimum test uncertainty at the highest throughput.



Built-in wavemeter for the optimum tuning precision

The Agilent 81672B, 81480B/482B, 81680B/682B and 81640B/642B modules with their built-in wavelength control loop push today's performance limits. As they are all mode-hop free tunable with continuous output power, they qualify for the test of the most

critical DWDM components. All seven modules fit into the bottom slot of the 8164B mainframe.

Test of optical amplifiers and passive components

The 81672B, 81482B, 81682B and 81642B modules provide the high stimulus power needed to test today's optical amplifiers. An optional (except 81672B), built-in optical attenuator allows an output power dynamic range of more than 60 dB. Its excellent wavelength precision makes it a multi-purpose instrument for all kinds of component test.

Polarization Maintaining Fiber for the test of integrated optical devices

The 81672B, 81480B/482B, 81680B/682B and 81640B/642B modules are ideally constructed to characterize integrated optical devices. Their Panda PMF output ports provide a well defined state of polarization to ensure constant measurement conditions on waveguide devices. A PMF cable easily connects an external optical modulator.

Low spontaneous emission for maximum measurement range

The 81480B, 81680B and 81640B modules are equipped with two optical outputs. One output port delivers a signal with ultra-low source spontaneous emission (SSE). It enables accurate crosstalk measurement of DWDM system components with many channels at narrow spacing.

To characterize steep notch filters such as Fiber Bragg Gratings, only a power meter module is required.

The second output port provides increased optical power and allows adjustment by more than 60 dB through a built-in optical attenuator.

Compact module for multi-channel test

A variable amount of the compact, yet fully remote controlled Agilent 81689A Tunable Laser modules, in combination with the 81482B, 682B and 81642B high power modules, is the ideal solution to characterize optical amplifiers for use in DWDM applications. Furthermore the 81689A allows a realistic multi-channel test bed for DWDM transmission systems to be set up.

The 8164B, 81672B, 81480B/ 482B, 81680B/ 682B, 81640B/ 642B and 81689A are produced to ISO 9001 international quality system standard as part of Agilent's commitment to continually increasing customer satisfaction through improved quality control.

Specifications describe the instrument's warranted performance. They are verified at the end of a 2 m long patchcord and are valid after warm-up and for the stated output power and wavelength ranges.

Each specification is assured by thoroughly analyzing all measurement uncertainties. Supplementary performance characteristics describe the instrument's non-warranted typical performance.

Every instrument is delivered with a commercial certificate of calibration and a detailed test report.

For further details on specifications, see the Definition of Terms in Appendix C of the Tunable Laser User's Guide.

81640B Tunable Laser Source, low SSE, 1600 nm

Agilent 81640B	
Wavelength range	1495 nm to 1640 nm
Wavelength resolution	0.1 pm, 12.5 MHz at 1550 nm
Mode-hop free tuning range	full wavelength range
Maximum tuning speed	80 nm/s
	Specification under static condition
	Add-on specification under dynamic condition ^[10] (typ.)
	@5 nm/s
	@40 nm/s
	@80 nm/s
Absolute wavelength accuracy ^{[1][2]}	± 10 pm
Relative wavelength accuracy ^{[1][2]}	± 5 pm, typ. ± 2 pm
Wavelength repeatability ^[2]	± 0.8 pm, typ. ± 0.5 pm
	Specification under dynamic condition (typ.)
Dynamic wavelength repeatability ^{[2][10]}	± 0.4 pm
Wavelength stability ^[2] (typ., 24 h at const. temp.)	≤ ± 1 pm
Linewidth (typ.), coherence control off	100 kHz
Effective linewidth (typ.), coherence ctrl. on	> 50 MHz (1510 – 1620 nm, at flat output power)
	Output 1 (low SSE)
	Output 2 (high power)
Output power ^[3] (continuous power during tuning)	≥ -5 dBm peak typ. ≥ -7 dBm (1520 – 1610 nm) ≥ -9 dBm (1510 – 1620 nm) ≥ -13 dBm (1495 – 1640 nm)
Minimum output power ^[3]	-13 dBm
Power linearity ^[3]	± 0.1 dB
Power stability ^{[3][9]}	± 0.01 dB, 1 hour typ. ± 0.03 dB, 24 hours
	Specification under static condition
	Dynamic relative power flatness ^[10] (typ.)
	@5 nm/s
	@40 nm/s
	@80 nm/s
Power flatness versus wavelength Output 1 (low SSE) ^[3]	± 0.2 dB typ. ± 0.1 dB
Power flatness versus wavelength Output 2 (high power) ^[3]	± 0.3 dB typ. ± 0.15 dB
Dynamic power reproducibility ^{[3][9][10]}	± 5 mdB
Power repeatability (typ.) ^{[3][9]}	± 3 mdB
Side-mode suppression ratio (typ.) ^{[4][8]}	≥ 40 dB (1520 – 1610 nm)
	Output 1 (low SSE)
	Output 2 (high power)
Signal to source spontaneous emission ratio ^{[5][6][8]}	≥ 60 dB/nm (1520 – 1610 nm) ^[7] ≥ 55 dB/nm (typ., 1510 – 1620 nm) ^[7] ≥ 50 dB/nm (typ., 1495 – 1640 nm) ^[7]
Signal to total source spontaneous emission ratio ^{[6][8]}	≥ 45 dB/nm (1520 – 1610 nm) ≥ 40 dB/nm (typ., 1510 – 1620 nm) ≥ 35 dB/nm (typ., 1495 – 1640 nm)
Relative intensity noise (RIN, typ.) ^[8]	≥ 55 dB (1520 – 1610 nm) ^[7] ≥ 45 dB (typ., 1495 – 1640 nm) ^[7]
	-145 dB/Hz (1520 – 1610 nm)

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

Wavelength Zeroing is an internal function that performs an automatic self-adjustment.

^[2] At CW operation. Measured with wavelength meter based on wavelength in vacuum.

^[3] Applies to the selected output.

^[4] Measured by heterodyning method.

^[5] Value for 1 nm resolution bandwidth.

^[6] Measured with optical spectrum analyzer.

^[7] Measured with Fiber Bragg Grating to suppress the signal.

^[8] Output power as specified per wavelength range and output port.

^[9] Warm up time 1 hour

^[10] Conditions: Any 50 nm between 1510 to 1620 nm at flat output power ≥ -9 dBm (for Output 1) or output power > 0 dBm (for Output 2).

Supplementary performance characteristics

Modulation

Internal digital modulation ^[1]
50% duty cycle, 200 Hz to 300 kHz.

Modulation output:
TTL reference signal.

External digital modulation ^[1]
> 45% duty cycle, fall time
< 300 ns, 200 Hz to 1 MHz.

Modulation input:
TTL signal.

External analog modulation
≥ ±15% modulation depth,
5 kHz to 20 MHz .

Modulation input:
5 V_{p-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.

Continuous sweep mode

Mode-hop free span
Agilent 81480B:
1430-1480 nm at flat output power
≥ -9 dBm (for Output 1) or ≥ 0 dBm
(for Output 2)

Agilent 81680B:
1520-1570 nm at flat output power
≥ -6 dBm (for Output 1) or ≥ 3 dBm
(for Output 2)

Agilent 81640B:
Any 50 nm between 1510-1620 nm at
flat output power ≥ -9 dBm (for
Output 1) or ≥ 0 dBm (for Output 2)

Agilent 81672B:
1300-1350 nm at flat output power
≥ 3 dBm

Agilent 81482B:
1430-1480 nm at flat output power
≥ 3 dBm

Agilent 81682B:
1520-1570 nm at flat output power
≥ 3 dBm

Agilent 81642B:
Any 50 nm within 1510-1620 nm at
flat output power ≥ 3 dBm

Ambient temperature within +20 °C
and +35 °C.

General

Output isolation (typ.):
50 dB.

Return loss (typ.):
60 dB (options 072);
40 dB (options 071).

Polarization maintaining fiber
(Options 071, 072)

Fiber type:
Panda.

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

Extinction ratio: 16 dB typ.

Laser class:
Class 1M according to IEC 60825-
1(2001), comply with 21 CFR 1040.10
except for deviations pursuant to Laser
Notice No. 50, dated 2001-July-26

Recommended re-calibration period:
2 years.

Warm-up time:
< 20 min
immediate operation after boot-up.

Environmental

Storage temperature:
-40 °C to + 70 °C.

Operating temperature:
10 °C to 35 °C.

Humidity:
< 80 % R.H. at 10 °C to 35 °C.

Specifications are valid in
non-condensing conditions.

^[1] displayed wavelength represents average
wavelength while digital modulation is
active.

Ordering Information

Lightwave Measurement System:
8164B Mainframe

Tunable Laser Module:

81480B Low-SSE, 1400 nm
(1370 to 1495 nm)

81680B Low-SSE, 1550 nm
(1460 to 1580 nm)

81640B Low-SSE, 1600 nm
(1495 to 1640 nm)

81672B High Power, 1300 nm
(1260 to 1375 nm)

81482B High Power, 1400 nm
(1370 to 1495 nm)

81682B High Power, 1550 nm
(1460 to 1580 nm)

81642B High Power, 1600 nm
(1495 to 1640 nm)

Connector Option: (Must)

Tunable Laser must be ordered with one connector option.

Option 071:

PMF, straight contact output connector.

Option 072:

PMF, angled contact output connector.

Other Options:

Option 003: built-in optical attenuator,
60 dB attenuation
(for 81482B, 682B and 642B).

Option 1CM: rack mount kit without
front handles for the 8164B mainframe.

Option 1CN: front handles for the
8164B mainframe.

Agilent 81645A Filler Module:

The 81645A filler module is required to operate the 8164B mainframe if it is used without an 81672B/48xB/68xB/64xB tunable laser module.

Connector Interface:

One Agilent 81000xl-series connector interface is required for 81672B, 482B, 682B, 642B.

Two Agilent 81000xl-series connector interfaces are required for 81480B, 81680B, 81640B.

Laser Safety Information

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

