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## **HP 81533B, HP 81520A, HP 81521B, HP 81524A, and HP 81525A Specifications**

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Specifications describe the instrument's warranted performance. Supplementary performance characteristics describe the instrument's non-warranted typical performance.

Because of the modular nature of the instrument, these performance specifications apply only to this module. You should insert these pages into the appropriate section of the manual.

## HP 81533B Specifications

	HP 81533B with HP 81520A Optical Head	HP 81533B with HP 81521B Optical Head	HP 81533B with HP 81524A Optical Head	HP 81533B with HP 81525A Optical Head
<b>Sensor Element</b>	Si, 5mm	Ge, 5mm	InGaAs, 5mm	
<b>Wavelength range</b>	450-1020nm	900-1700nm	800-1650nm	
<b>Power range</b>	+10 to -100dBm	+3 to -80dBm	+3 to -90dBm	+27 to -70dBm (1250 to 1650nm) +23 to -70dBm (800 to 1650nm)
<b>Display resolution</b>	0.001dB/dBm (0.0001dB/dBm on printout), 0.01pW tpo 10pW (depending on power range)			
<b>Applicable fiber type</b>	parallel beam, 9/125 $\mu$ m - 100/140 $\mu$ m, NA $\leq$ 0.3			
<b>Uncertainty (Accuracy) at reference conditions<sup>[1]</sup></b>	$\pm$ 2.2% (600-1020nm)	$\pm$ 2.2% (1000-1650nm)	$\pm$ 2.2% (1000-1600nm)	$\pm$ 3% (900-1600nm)
<b>Total Uncertainty<sup>[2]</sup></b>	$\pm$ 4% $\pm$ 0.5pW (600-1020nm)	$\pm$ 4% $\pm$ 50pW (1000-1650nm)	$\pm$ 4% $\pm$ 5pW (1000-1600nm)	$\pm$ 5% $\pm$ 500pW <sup>[3]</sup> (900-1600nm)
<b>Linearity</b>	(+3 to -80dBm)	(0 to -60dBm)	(+3 to -70dBm)	(+10 to -50dBm) <sup>[3]</sup>
18°C to 28°C const. temp	$\pm$ 0.04dB $\pm$ 0.5pW	$\pm$ 0.04dB $\pm$ 50pW	$\pm$ 0.04dB $\pm$ 5pW	$\pm$ 0.04dB $\pm$ 500pW
Operating temp. range const. temp	$\pm$ 0.15dB $\pm$ 0.5pW	$\pm$ 0.15dB $\pm$ 50pW	$\pm$ 0.15dB $\pm$ 5pW	$\pm$ 0.15dB $\pm$ 500pW
<b>Noise</b>	<0.5pW	<50pW	<5pW	<500pW
peak-peak, avg. time 1sec	(700-900nm)	(1200-1600nm)	(1000-1600nm)	(900-1600nm)
<b>Operating Temperature</b>	0°C to +40°C			0°C to +35°C <sup>[4]</sup>
<b>Dimensions</b>				
Module	75mm H, 32mm W, 335mm D (2.8"×1.3"×13.2")			
Head	37.5mm Diameter, 140mm Long (1.5"×5.5")			
<b>Weight</b>				
Module	net 0.6kg (1.3lbs), shipping 1kg (2.2lbs)			
Head	net 0.45kg (1lbs), shipping 1kg (2.2lbs)			
<b>Recalibration period</b>	2 years			
<b>Warmup time</b>	20 min.			
The display may vary by $\pm$ 1 count.				

Information on the traceability of power meters is available on request

[1] at the following reference conditions:

- Power level 10 $\mu$ W (-20dBm), Continuous Wave (CW).
- Parallel beam, 3mm spot diameter on detector.
- Ambient temperature 23°C $\pm$ 5K
- At day of calibration. (add 0.3% for aging over one year, add 0.6% over two years).
- Spectral width of source <10nm

[2] at the following operating conditions:

- Parallel beam, 3mm spot diameter on detector, or connectorized fiber with  $NA \leq 0.2$
- Ambient temperature 0 to 40°C, non-condensating.
- Within 1 year after calibration, add 0.3% for the second year.

[3] Add 0.008dB/10mW between 10 and 27dBm.

- Lens required (for example for SM 81010BL, for MM 81050BL) or parallel beam, 3mm spot diameter on detector.
- Wavelength range 950-1650 nm.

[4] 30°C for >20dBm input power.

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## Supplementary Performance Characteristics

Add 1% to total uncertainty for the full wavelength range (except HP 81525A: see footnote 3).

Outside the specified wavelength range, the noise increases by up to 5 times the value shown above.

For fiber applications with NA between 0.2 and 0.3 use specific lenses and add 0.5% total uncertainty for the 850±50nm, 1300±50nm, and 1550±50nm range.

<b>Analog output</b>	
bandwidth	$\geq DC, \leq 300$ to 1000Hz depending on range and optical head
output voltage	0 to 2V into open
output impedance	600Ω typ.
max. input voltage	±10V