

# Optical Head Specifications

All optical heads have to be operated with the single (Agilent 81618A) or dual (Agilent 81619A) Interface Modules.

**Table 1 Optical Head Specifications**

	Agilent 81623A	Agilent 81624A	Agilent 81625A	Agilent 81625B
<b>Sensor Element</b>	Ge, Ø 5 mm	InGaAs, Ø 5 mm		
<b>Wavelength Range</b>	750 - 1800 nm	800 - 1700 nm	850 - 1650 nm	850 - 1650 nm
<b>Power Range</b>	+10 to -80 dBm	+10 to -90 dBm	+20 to -80 dBm	+27 to -70 dBm (1250 - 1650 nm) +23 to 70 dBm (850 - 1650 nm)
<b>Display Resolution</b>	0.0001 dB / dBm, 0.001 pW to 1 pW (depending on power range)			
<b>Applicable Fiber Type</b>	Standard SM and MM max 100 µm core size, NA ≤ 0.3			
<b>Open Beam</b>	Parallel beam max Ø 5 mm			
<b>Uncertainty at Reference Conditions</b> <sup>1</sup>	±2.2% (1000 to 1650 nm)	±2.2% (1000 to 1630 nm)	±2.5% (950 to 1630 nm)	±3.0% (950 to 1630 nm)
<b>Total Uncertainty</b> <sup>2</sup>	+3.5% (1000 to 1650 nm)	±3.5% (1000 to 1630 nm)	±4.0% (950 to 1630 nm)	±5.0% (950 to 1630 nm)
<b>Relative Uncertainty</b> <sup>7</sup>				
- due to polarization <sup>3</sup>		± 0.005 dB (typ. ± 0.002 dB)	± 0.005 dB (typ. ± 0.002 dB)	± 0.005 dB (typ. ± 0.002 dB)
Spectral ripple (due to interference) <sup>4</sup>		± 0.005 dB (typ. ± 0.002 dB)	± 0.005 dB (typ. ± 0.002 dB)	± 0.005 dB (typ. ± 0.002 dB)
<b>Linearity (power)</b> <sup>5</sup>	(CW +10 to -60 dBm) (1000 - 1650 nm)	(CW +10 to 70 dBm) (1000 - 1630 nm)	(CW +20 to -60 dBm) (950 - 1630 nm)	(CW +27 to -50 dBm) (950 - 1630 nm)
- at 23°C ±5°C	<±0.02 dB ± 100 pW <sup>9</sup>	<±0.02 dB ± 5 pW	<±0.02 dB ± 100 pW <sup>8</sup>	<±0.04 dB ± 500 pW <sup>11</sup>
- at operating temp. range	<±0.05 dB ± 100 pW <sup>9</sup>	<±0.05 dB ± 5 pW	<±0.05 dB ± 100 pW <sup>8</sup>	<±0.15 dB ± 500 pW <sup>11</sup>
<b>Return Loss</b> <sup>7</sup>	> 45 dB	typ. 60 dB	> 60 dB	> 45 dB
<b>Noise (peak to peak)</b> <sup>5,6</sup>	< 100 pW	< 5 pW	< 100 pW	< 500 pW
<b>Averaging Time (minimal)</b>	100 µs			
<b>Dimensions (H x W x D)</b>	75 mm x 32 mm x 335 mm (2.8" x 1.3" x 13.2")			
<b>Weight</b>	0.5 kg			
<b>Recalibration Period</b>	2 years			
<b>Operating Temperature</b>	0°C to +40°C		0°C to +35°C	0°C to +35°C <sup>10</sup>
<b>Humidity</b>	Non-condensing			
<b>Warm-up time</b>	40 minutes			

**Table 1 Optical Head Specifications**

	Agilent 81623A	Agilent 81624A	Agilent 81625A	Agilent 81626B
<b>1</b>	Reference Conditions:			
	<ul style="list-style-type: none"> <li>Power level 10 <math>\mu</math>W (-20 dBm), continuous wave (CW)</li> <li>Parallel beam, 3 mm spot diameter on the center of the detector</li> <li>Ambient temperature 23 °C <math>\pm</math> 5 °C</li> <li>On day of calibration (add <math>\pm</math> 0.3% for aging over one year; add <math>\pm</math> 0.6% over two years)</li> <li>Spectral width of source &lt; 10 nm (FWHM)</li> <li>Wavelength setting at power meter must correspond to source wavelength <math>\pm</math> 0.4 nm</li> </ul>			
<b>2</b>	Total uncertainty includes: polarization, interference, linearity conditions:			
	<ul style="list-style-type: none"> <li>Parallel beam, 3mm spot diameter on the center of the detector or connectorized fiber with NA <math>\leq</math> 0.2</li> <li>For NA &gt; 0.2, add 1%</li> <li>Within one year after calibration, add 0.3% for second year</li> </ul>			
<b>3</b>	All states of polarization at constant wavelength (1550 nm $\pm$ 30 nm) and constant power, straight connector, T = 23°C $\pm$ 5°. For angled connector (8°) add 0.01 dB typ.			
<b>4</b>	Conditions: Wavelength 1550 nm $\pm$ 30 nm, fixed state of polarization, constant power, Temperature 23°C $\pm$ 5°C, Linewidth of source $\geq$ 100 MHz, angled connector 8°.			
<b>5</b>	At constant temperature ( $\Delta$ T = $\pm$ 1°C), zeroing required.			
<b>6</b>	Averaging time 1s, T = 23°C $\pm$ 5°C, observation time 300 s. Wavelength range 1200 - 1630 nm.			
<b>7</b>	Conditions			
	<ul style="list-style-type: none"> <li>Wavelengths 1550 nm <math>\pm</math> 30 nm.</li> <li>Standard single-mode fiber, angled connector min 8°.</li> </ul>			
<b>8</b>	For input power >+10 mW add:			
	typ. $\pm$ 0.001 dB / mW without Agilent 81000AF, or add $\pm$ 0.02 dB / mW with Agilent 81000AF (direct coupled)			
<b>9</b>	For input power > 2 mW, add $\pm$ 0.004 dB / mW			
<b>10</b>	30°C for > +20 dBm input power			
<b>11</b>	For input power >+10 mW add:			
	typ. $\pm$ 0.0016 dB / mW without Agilent 81000AF, or add $\pm$ 0.0008 dB / mW with Agilent 81000AF (direct coupled)			
	In the case of a negative power change >50 dB allow an addition recovery time of 3 minutes.			