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# Technical Specifications (continued)

High power sensor module	81630B
Sensor element	InGaAs
Wavelength range	970 nm to 1650 nm
Power range	-70 dBm to +28 dBm
Applicable fiber type	Standard SM and MM up to 100 μm core size, NA ≤0.3
Uncertainty (accuracy) at reference conditions <sup>1</sup>	±3.0% for 1255 nm to 1630 nm at 980 nm ±3.5% (add ±0.5% per nm if 980 nm is not the center wavelength) at 1060 nm ±4.0% (add ±0.6% per nm if 1060 nm is not the center wavelength),
Total uncertainty <sup>2,8</sup>	$\pm 5\%$ $\pm 1.2$ nW (1255 nm to 1630 nm) at 980 nm $\pm 5.5\%$ $\pm 1.2$ nW (add $\pm 0.5\%$ per nm if 980 nm is not the center wavelength) at 1060 nm $\pm 6.0\%$ $\pm 1.2$ nW (add $\pm 0.6\%$ per nm if 1060 nm is not the center wavelength)
Relative uncertainty:	
- due to polarization <sup>3</sup> - spectral ripple (due to interference) <sup>4</sup>	$<\pm0.01~dB$ $<\pm0.005~dB$
Linearity (power): 5	CW - 50 dBm to + 28 dBm (970 nm - 1630 nm)
- at 23 °C ± 5 °C	≤±0.05 dB <sup>8</sup>
- at operating temp. range	≤±0.15 dB <sup>8</sup>
Return loss 7	> 55 dB
Noise (peak to peak) <sup>6</sup>	< 1.2 nW (1255 nm – 1630 nm)
Averaging time (minimal)	100 μs
Maximum safe input power	+28.5 dBm
Analog Output	Included
Dimensions (H x W x D)	75 mm x 32 mm x 335 mm (2.8" x 1.3" x 13.2")
Weight	0.6 kg
Recommended recalibration period	2 years
Operating temperature	0 °C to +35 °C <sup>9</sup>
Humidity	Non-condensing
Warm-up time	20 min

- 1. Reference Conditions:
  - · Power level 80 μW, continuous wave (CW)
  - SM Fiber; 9 μm; NA = 0.1
  - · Ambient temperature 23 °C ±5 °C
  - On day of calibration (add ±0.3% for aging over one year, add ±0.6% over two years)
  - Spectral width of source < 10 nm (FWHM)</li>
  - Wavelength setting at power sensor must correspond to source wavelength  $\le \pm 0.4$  nm
- 2. Operating Conditions:
  - Fiber ≤50 μm, NA ≤0.2
  - Connectors with 2.5 mm ferrule with flat face (fiber tip offset not more than 0.3 mm from 2.5 mm cross-section) with straight or angled polish
  - Averaging time 1 s

- Within one year after calibration; add 0.3% for second year
- Operating temperature range as specified, humidity: non-condensing
- All states of polarization at constant wavelength (1550 nm ±30 nm) and constant power, straight connector, T = 23 °C ±5 °C. For angled connector (8 °) add ±0.01 dB typ.
- 4. Conditions:
  - Wavelength 1550 nm ±30 nm, fixed state of polarization, constant power
  - · Temperature 23 °C ±5 °C
  - Linewidth of source ≥ 100 MHz
  - · Angled connector 8 °

- 5. Does not include noise
- 6. Averaging time 1 s, T = 23 °C  $\pm$ 5 °C,  $\Delta$ T  $\pm$ 1 °C, observation time 300 s.
- 7. Conditions:
  - Wavelengths 1310 nm ±30 nm and 1550 nm ±30 nm
  - · Standard single mode fiber
  - · Angled connector min 8 °
  - T = 23 °C ±5 °C
- 8. For input power > +10 mW add: typ. ±0.0012 dB/mW. In case of negative power change > 50 dB allow additional recovery time of 3 min
- 9. 30 °C for > +20 dBm input power

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