

Fast power sensor module specifications (Autorange mode)

	Agilent 81636B	Agilent 81637B
Sensor element	InGaAs	InGaAs
Wavelength range	1250 - 1640 nm	1250 - 1640 nm
Power range	+10 to -80 dBm	+10 to -80 dBm
Applicable fiber type	Standard SM and MM up to 62.5 μ m core size, NA \leq 0.24	Standard SM and MM up to 100 μ m core size, NA \leq 0.3
Uncertainty (accuracy) at reference conditions ^[1]	$\pm 3 \%$ (1260 nm to 1630 nm)	$\pm 3 \%$ (1260 nm to 1630 nm)
Total uncertainty ^{[2] [9]}	$\pm 5\% \pm 20 \text{ pW}$ ^[8] (1260 nm to 1630 nm)	$\pm 5\% \pm 20 \text{ pW}$ (1260 nm to 1630 nm)
Relative uncertainty: - due to polarization ^[3] - spectral ripple (due to interference) ^[4]	typ. $\pm 0.015 \text{ dB}$ typ. $\pm 0.015 \text{ dB}$	$< \pm 0.005 \text{ dB}$ $< \pm 0.005 \text{ dB}$
Linearity (power) ^{[5] [9]} - at 23°C $\pm 5^\circ\text{C}$ - at operating temp. range	CW +10 to -60 dBm (1260 nm to 1630 nm) $< \pm 0.02 \text{ dB} \pm 20 \text{ pW}$ $< \pm 0.06 \text{ dB} \pm 20 \text{ pW}$	CW +10 to -60 dBm (1260 nm to 1630 nm) $< \pm 0.02 \text{ dB} \pm 20 \text{ pW}$ $< \pm 0.06 \text{ dB} \pm 20 \text{ pW}$
Return loss ^[7]	$> 40 \text{ dB}$	$> 55 \text{ dB}$
Noise (peak to peak) ^{[5] [6]}	$< 20 \text{ pW}$	$< 20 \text{ pW}$
Averaging time (minimal)	25 μs	25 μs
Dynamic Range at manual range mode ^{[5] [10]} - at +10dBm-range - at ± 0 dBm-range - at -10dBm-range - at -20dBm-range	typ. $> 55 \text{ dB}$ typ. $> 55 \text{ dB}$ typ. $> 52 \text{ dB}$ typ. $> 45 \text{ dB}$	typ. $> 55 \text{ dB}$ typ. $> 55 \text{ dB}$ typ. $> 52 \text{ dB}$ typ. $> 45 \text{ dB}$
Linearity (power) at manual range mode: ^{[5] [11]} - at +10dBm-range - at ± 0 dBm-range - at -10dBm-range - at -20dBm-range	CW +10 to -60 dBm (1260 nm to 1630 nm) $< \pm 0.02 \text{ dB} \pm 50 \text{ nW}$ $< \pm 0.02 \text{ dB} \pm 5 \text{ nW}$ $< \pm 0.02 \text{ dB} \pm 1 \text{ nW}$ $< \pm 0.02 \text{ dB} \pm 500 \text{ pW}$	CW +10 to -60 dBm (1260 nm to 1630 nm) $< \pm 0.02 \text{ dB} \pm 50 \text{ nW}$ $< \pm 0.02 \text{ dB} \pm 5 \text{ nW}$ $< \pm 0.02 \text{ dB} \pm 1 \text{ nW}$ $< \pm 0.02 \text{ dB} \pm 500 \text{ pW}$
Analog Output	included	included
Dimensions (H x W x D)	75 mm x 32 mm x 335 mm (2.8" x 1.3" x 13.2")	
Weight	0.5 kg	
Recalibration period	2 years	
Operating temperature	+10°C to +40°C	+10°C to +40°C
Humidity	Non-condensing	
Warm-up time	20 min	

^[1] Reference conditions:

- Power level 10 μW (-20dBm), continuous wave (CW)
- Fiber 50 μm graded-index, NA=0.2
- Ambient temperature 23°C $\pm 5^\circ\text{C}$
- On day of calibration (add $\pm 0.3 \%$ for aging over one year, add $\pm 0.6 \%$ over two years)
- Spectral width of source $< 10 \text{ nm}$ (FWHM)
- Wavelength setting at powermeter must correspond to source wavelength $\pm 0.4 \text{ nm}$

^[2] Operating Conditions:

- Fiber $\leq 50 \mu\text{m}$, NA ≤ 0.2
- Within one year after calibration, add 0.3 % for second year
- Add $\pm 1\%$ for Biconic connector

- Operating temperature range as specified humidity: non-condensing

^[3] All states of polarization at constant wavelength (1550 nm $\pm 30 \text{ nm}$) and constant power, straight connector, T = 23°C $\pm 5^\circ$. For angled connector (8°) add $\pm 0.01 \text{ dB}$ typ.

^[4] Conditions:
Wavelength 1550 nm $\pm 30 \text{ nm}$, fixed state of polarization, constant power, Temperature 23°C $\pm 5^\circ\text{C}$
Linewidth of source $\geq 100 \text{ MHz}$, angled connector 8°.

^[5] At const. Temperature ($\Delta T = \pm 1^\circ\text{C}$)

^[6] Averaging time 1s, T = 23°C $\pm 5^\circ\text{C}$, observation time 300 s.
Wavelength range 1260-1630 nm.

^[7] Conditions:

Wavelengths 1310nm $\pm 30 \text{ nm}$ and 1550nm $\pm 30 \text{ nm}$.

Standard single mode fiber, angled connector min 8°. T = 23°C $\pm 5^\circ\text{C}$

^[8] For wavelengths $> 1600 \text{ nm}$ add $\pm 0.06\%/ \text{nm}$

^[9] For input power $> 2 \text{ mW}$ add $\pm 0.02 \text{ dB}$

^[10] Conditions:

Averaging time 25us, T = 23°C $\pm 5^\circ$, Observation time 2.5 s

^[11] Averaging time 25us, T = 23°C $\pm 5^\circ$