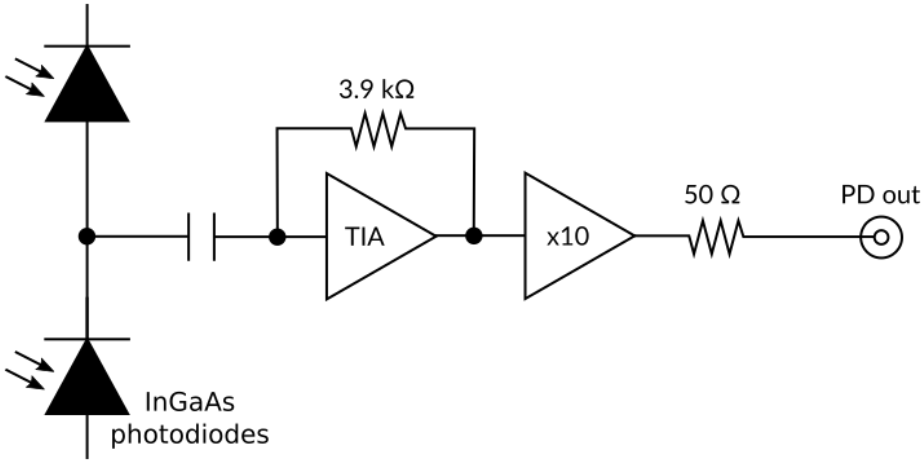
100 MHz balanced photodetector

Koheron PD100B is an amplified balanced detector with 39 kV/A gain, 100 MHz bandwidth and a common mode rejection ratio of 35 dB. Available in AC and DC coupled versions, with mounted InGaAs photodiodes or without photodiodes, the PD100B is ideal for applications such as Optical Coherence Tomography and Lidar sensing.

Specifications

	PD100B-AC	PD100B-DC
Coupling	AC	DC
Power supply (positive)	6 - 12 V_{DC}	6 - 12 V_{DC}
Power supply (negative)	-12 to -6 V_{DC}	-12 to -6 V_{DC}
Small signal bandwidth	160 Hz - 100 MHz at 3 dB (C_{in} = 8 pF)	0 - 100 MHz at 3 dB (C_{in} = 8 pF)
Transimpedance gain	39 kV / A	39 kV / A
Output voltage range	±3 V	±3 V
CMRR at 1 MHz	35 dB	35 dB
Input current noise density	8 pA / √Hz (at 10 MHz, C_{in} = 8 pF)	8 pA / √Hz (at 10 MHz, C_{in} = 8 pF)
DC cutoff frequency	160 Hz	N.A.
Output impedance	50 Ω	50 Ω
Outside Dimensions	63 mm x 38 mm x 14 mm	63 mm x 38 mm x 14 mm
Weight	21 g	21 g
Output	SMA	SMA
Mechanical details	Compatible with M6 metric breadboards (25 mm spacing)	Compatible with M6 metric breadboards (25 mm spacing)
InGaAs photodiodes		
Wavelength range	900 - 1700 nm	900 - 1700 nm
Optical input power	0 - 1.5 mW	0 - 1.5 mW
Photodiode connector	FC	FC
Photodiode active diameter	300 µm	300 µm
Photodiode peak responsivity	0.90 A / W	0.90 A / W
Operating temperature	0 °C - 50 °C	0 °C - 50 °C

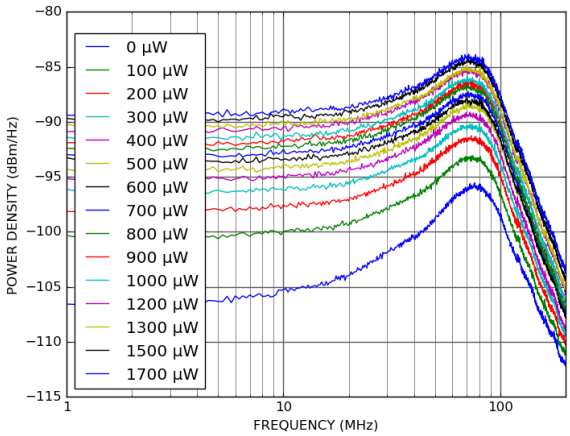
Functional diagram



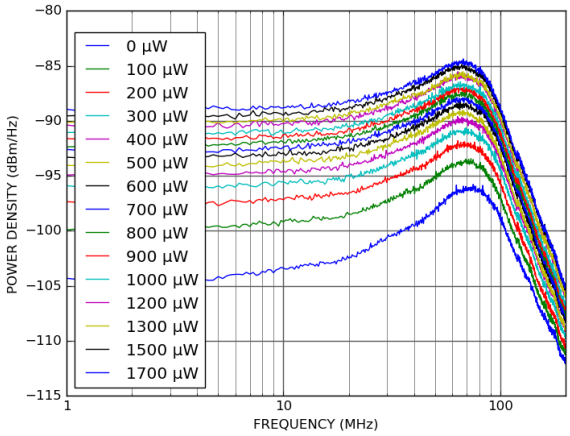
Characterization

Output power spectral density

The power spectral density of the PD100B output was measured for different incident optical powers. The indicated power is the incident power per photodiode. The PD100B output is directly connected to the spectrum analyzer (Tektronix RSA306). Optical source is a Koheron LD100 laser at 1550 nm.



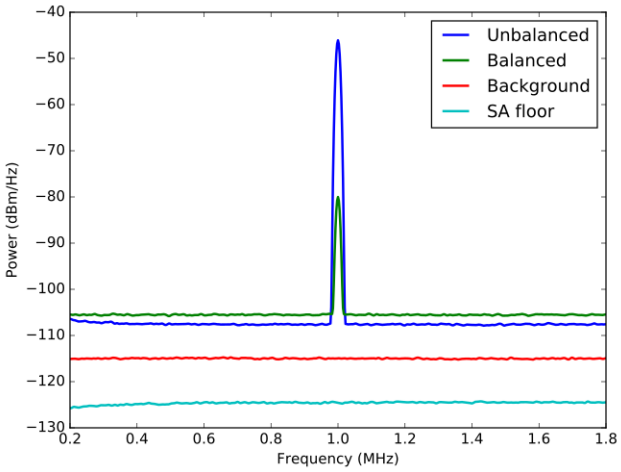
DC-coupled PD100B output power density



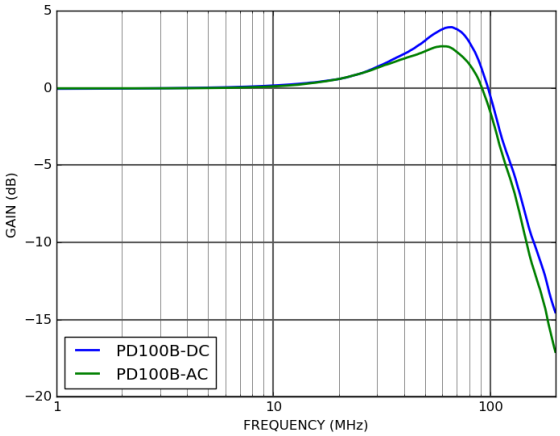
AC-coupled PD100B output power density

Common mode rejection ratio

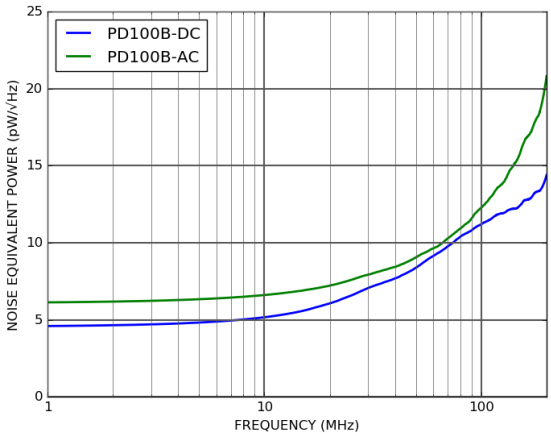
When properly balanced, the common mode rejection ratio (CMRR) at 1 MHz of the PD100B is 35 dB. To maximize the CMRR care should be taken not only to balance the optical powers, but also the path length between the two channels.



Frequency response



Noise equivalent power


PD100B-DC
PD100B-AC
NOISE EQUIVALENT POWER (pW/√Hz)
FREQUENCY (MHz)
0
5
10
15
20
25
1
10
100

Ordering codes

- **PD100B-AC:** InGaAs photodiodes mounted / Coupling AC
- **PD100B-DC:** InGaAs photodiodes mounted / Coupling DC
- **PD100B-AC-NOP:** No photodiodes / Coupling AC
- **PD100B-DC-NOP:** No photodiodes / Coupling DC