

# Low noise photodetector

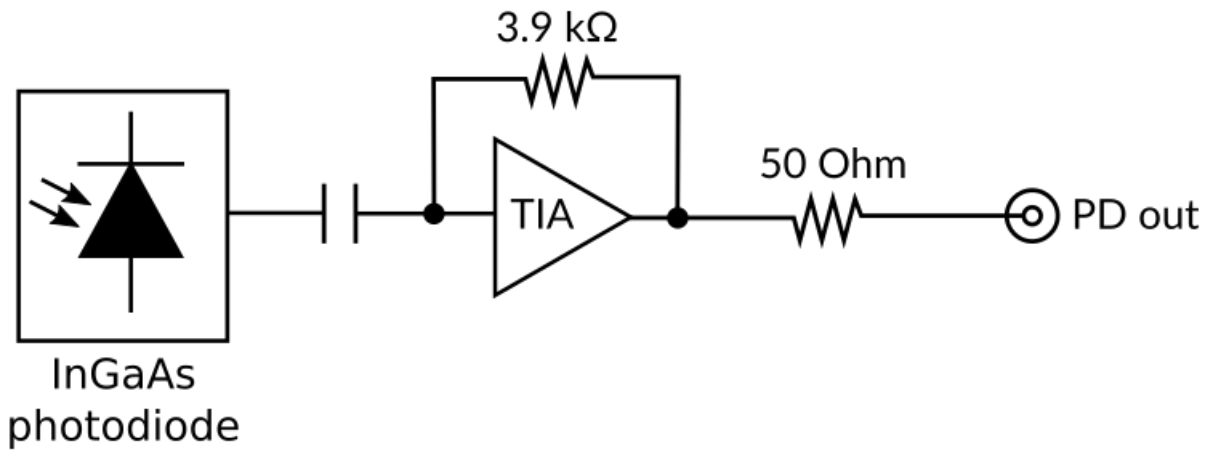


Koheron PD100 photodetectors are amplified photodetectors with a bandwidth in excess of 100 MHz. Designed for shot noise limited operation with hundreds of  $\mu\text{W}$  of incident power, PD100 photodetectors make perfect candidates for coherent sensing. PD100 photodetectors are available with mounted InGaAs photodiode or without photodiode and in AC or DC coupled versions.

## Specifications

|                              | PD100-AC  | PD100-DC  |
|------------------------------|---|---|
| Coupling                     | AC  | DC  |
| Power supply (positive)      | 6 - 12 V <sub>DC</sub>  | 6 - 12 V <sub>DC</sub>  |
| Power supply (negative)      | -12 to -6 V <sub>DC</sub>                                     | -12 to -6 V <sub>DC</sub>                                     |
| Small signal bandwidth       | 1.6 kHz - 105 MHz at 3 dB (C <sub>in</sub> = 4 pF)            | 0 - 110 MHz at 3 dB (C <sub>in</sub> = 4 pF)                  |
| Transimpedance gain          | 3.9 kV / A  | 3.9 kV / A  |
| Input current noise density  | 9 pA / $\sqrt{\text{Hz}}$ (at 10 MHz, C <sub>in</sub> = 4 pF) | 7 pA / $\sqrt{\text{Hz}}$ (at 10 MHz, C <sub>in</sub> = 4 pF) |
| Offset voltage               | $\pm 2$ mV  | $\pm 2$ mV  |
| Output impedance             | 50 $\Omega$   | 50 $\Omega$   |
| Outside Dimensions           | 38 mm x 53 mm x 14 mm   | 38 mm x 53 mm x 14 mm   |
| Outputs                      | SMA   | SMA   |
| Mechanical details           | Compatible with M6 metric breadboards (25 mm spacing)         | Compatible with M6 metric breadboards (25 mm spacing)         |
| Weight                       | 15 g  | 15 g  |
| InGaAs photodiode            |   |   |
| Wavelength range             | 900 - 1700 nm   | 900 - 1700 nm   |
| Optical input power          | 0 - 2.5 mW  | 0 - 0.6 mW  |
| Photodiode connector         | FC  | FC  |
| Photodiode active diameter   | 300 $\mu\text{m}$   | 300 $\mu\text{m}$   |
| Photodiode peak responsivity | 0.90 A / W  | 0.90 A / W  |
| Operating temperature        | 0 °C - 50 °C  | 0 °C - 50 °C  |

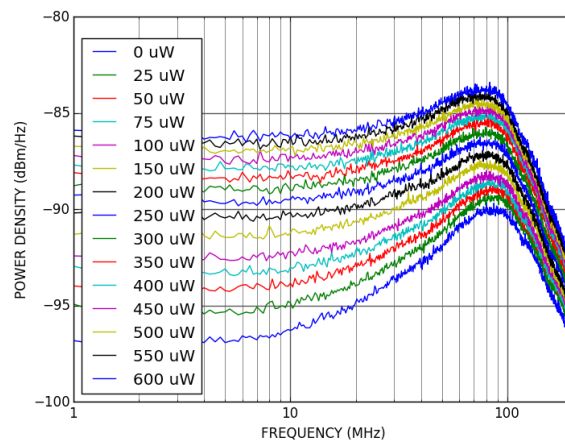
## Functional diagram

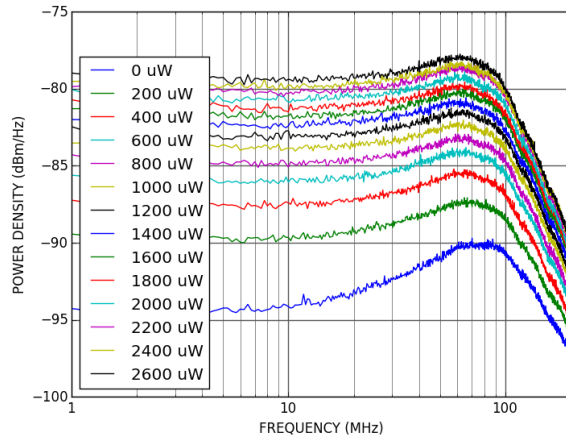


## Characterization

### Output power spectral density

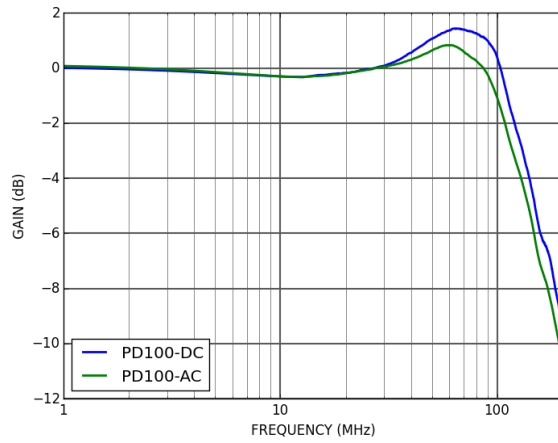
The power spectral density of the PD100 output is given for different incident optical powers. The spectrum analyzer is a Tektronix RSA306 in series with a Mini-Circuits ZFL-500LN+ 28 dB low-noise amplifier. Optical source is a [Koheron LD100 laser](#) at 1550 nm .



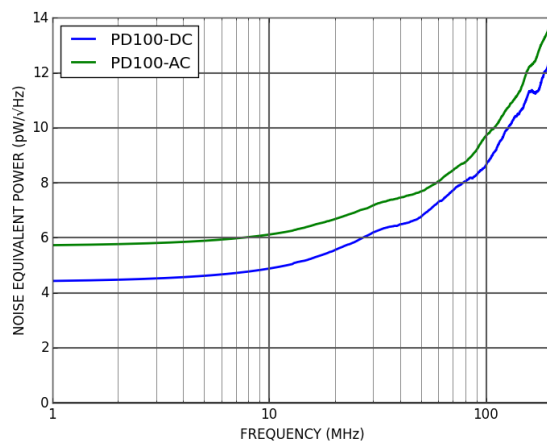


AC-coupled PD100 output power density

### Frequency response



### Noise equivalent power



## Ordering codes

- PD100-AC: InGaAs photodiode mounted / Coupling AC
- PD100-DC: InGaAs photodiode mounted / Coupling DC
- PD100-AC-NOP: No photodiode / Coupling AC
- PD100-DC-NOP: No photodiode / Coupling DC