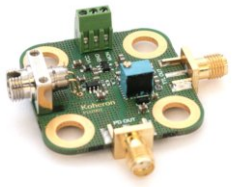
PD200T - 200 MHz TTL-analog photodetector

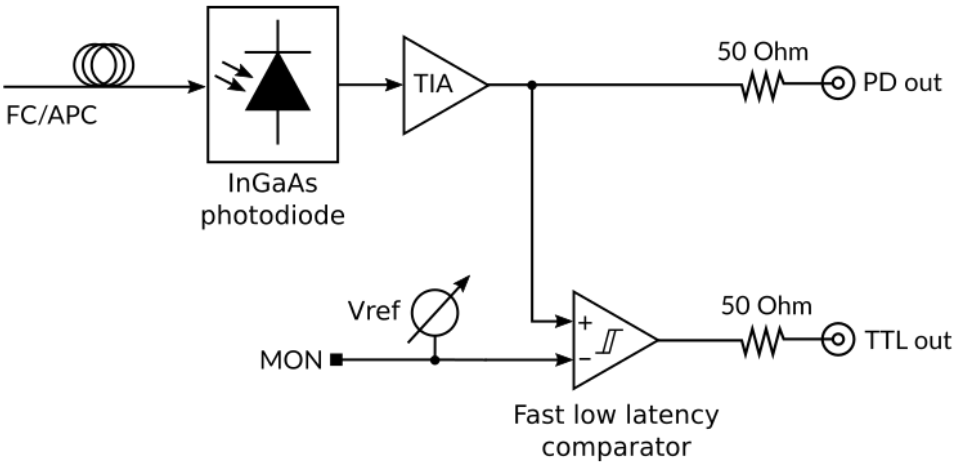


Koheron PD200T is an InGaAs photodetector with a dual TTL-analog output. The analog output has a gain of 500 V/A and a 200 MHz bandwidth. The TTL output has 2.5 ns propagation delay, 1.3 ns rise time and 0.7 ns fall time. Trigger threshold can be adjusted with a precision trimmer.

Specifications

	PD200T
Wavelength range	900 - 1700 nm
Optical input power	0 - 2 mW
Noise Equivalent Power	30 pW/√Hz (at 100 kHz)
Analog output	
Small signal bandwidth	200 MHz at 3 dB
Impulse response	2 ns (FWHM)
Transimpedance gain	500 V/A (Hi-Z), 250 V/A (50 Ω)
Analog output impedance	50 Ω
Analog output dark offset	10 mV
Analog output current max	80 mA
Analog output voltage	3 V_{pp} (Hi-Z), 1.5 V_{pp} (50 Ω)
Analog output slew rate	400 V/µs (50 Ω), 600 V/µs (Hi-Z)
TTL output	
TTL rise / fall time	1.5 ns
Logic low	0.1 V (max. Hi-Z), 0.05 V (max. 50 Ω)
Logic high	2.6 V (min. Hi-Z), 1.3 V (min. 50 Ω)
TTL output current max	20 mA
TTL output impedance	50 Ω
Other	
Power Supply	3.7 - 15 V_{DC}
Photodiode connector	FC
Output connectors	SMA
Outside Dimensions	48 mm x 53 mm x 14 mm
Weight	20 g
Mechanical details	Compatible with M6 metric breadboards (25 mm spacing)

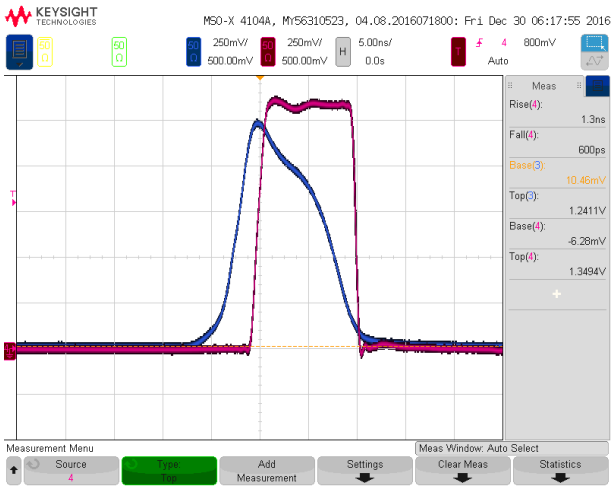
Functional diagram



Characterization

Pulse detection

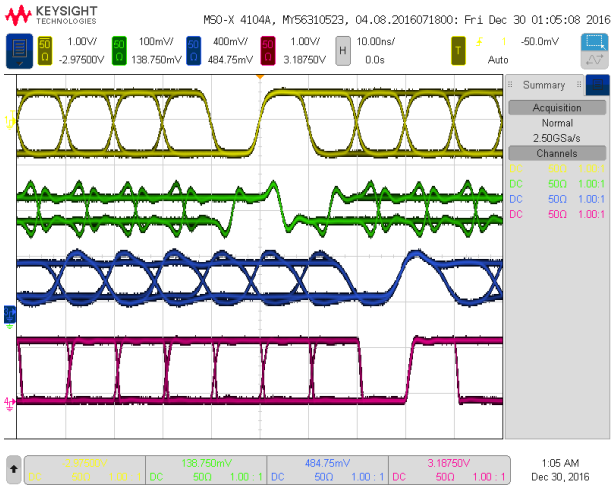
We operated the Koheron LD100 laser in pulsed-mode (width of 10 ns, pulse period of 100 ns, 10 V_{pp} modulation). The laser average output power was 850 µW. Half of this power was used to feed the PD200T. Trigger threshold was adjusted to 1.0 V. The figure below shows the analog output (in blue) and the TTL output (in purple) observed on an oscilloscope:



Propagation delay between the analog and the TTL output is about 2.5 ns. TTL rise and fall times (10 to 90 %) are 1.3 ns and 0.7 ns, respectively.

PRBS modulation

We modulated the Koheron LD100 laser with a 100 Mbps pseudo random binary sequence (PRBS) shown in yellow in the figure below. The green curve represents the modulation detected by the 100 MHz photodetection of the LD100. The analog and TTL output of the PD200T are shown in blue and red, respectively.



The 25 ns delay between the laser modulation (in orange) and the PD200T analog output (in blue) corresponds to the 5 m fiber between the laser and the PD200T.