WL-BPD1GA

(Rev. 1i, 02/2017)

1 GHz Dual-Balanced InGaAs Low Noise Photodetector

Features

- High transimpedance gain: 3500 V/W (1550 nm)
- Low noise: below -130 dBm/Hz
- NEP: 20 $\mathrm{pW}/\sqrt{\mathrm{Hz}}$ typ.
- 1 GHz bandwidth
- AC coupled; low cutoff below 300 kHz
- Wavelength range: 1000 nm to 1700 nm
- Fiber Coupled: FC receptables
- Output: 50 Ω SMA plug
- Wide range single supply: 11 to 15 V

Typical Application

- Ultrahigh speed (MHz) SS-OCT imaging
- Can be used single-ended as well

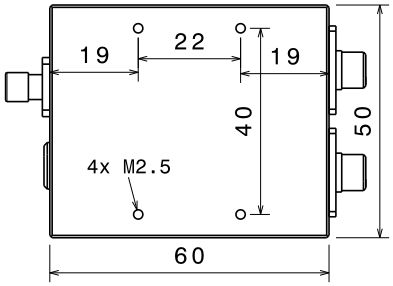
General Description

The BPD1GA is an AC-coupled high-speed dual-balanced InGaAs photoreceiver. Due to its high transimpedance gain, its very low noise, and its bandwidth of 1 GHz, it is ideally suited for future ultrahigh speed swept-source OCT systems with depth scan line rates up to above 1 MHz.

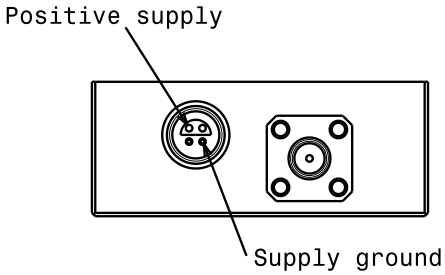
The BPD1GA comes in a rugged aluminum case with two FC fiber receptables and a 50 Ω SMA output. It operates from a single 11–15 V DC supply. OEM versions without a case are available upon request.

Mechanical Properties

- Fiber coupling: FC receptables for FC/PC and FC/APC connectors
- RF output: SMA (female)
- Supply voltage input: Push-pull LEMO plug (included with diode)
- Small form factor: 50×60×20 mm
- Mounting: 4x M2.5 threaded holes on bottom (screw length 4 mm)



Electrical Connectors



Supply connector (front view). The case is electically connected to ground.

There are two types of supply cable, one has 2 wires and one has 5 wires. The corresponding color scheme of these cables is:

Cable type	Positive supply	Supply ground
2-wire	white	brown, shield
5-wire	yellow	grey, shield

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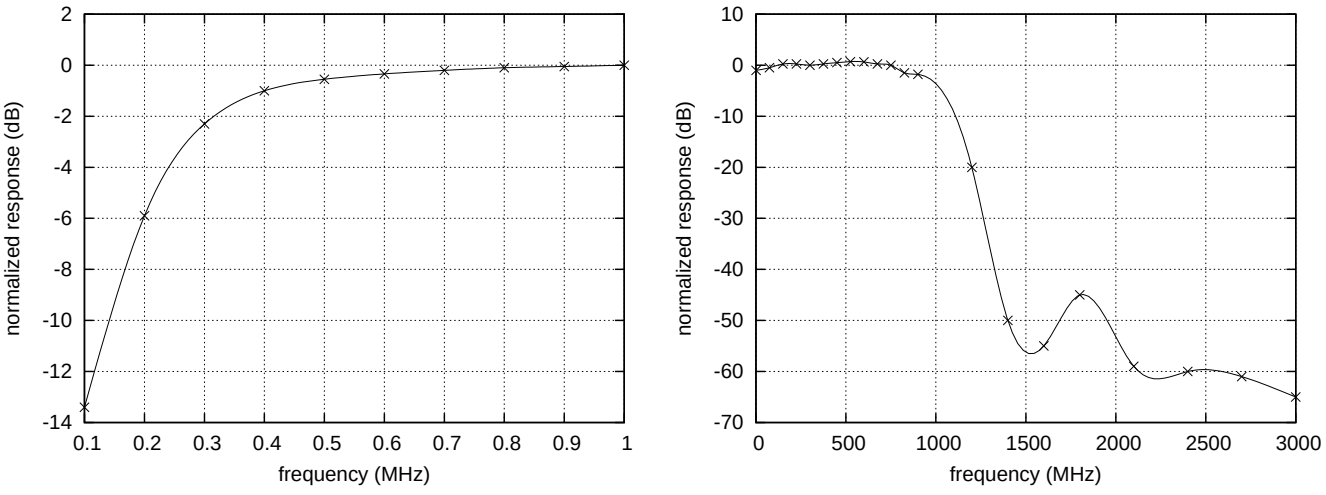
Specifications

Parameter	Conditions	Min	Typ	Max	Units
DC Characteristics					
Supply Voltage (V_S)		11		15	V
Supply Current			110		mA
AC Characteristics					
6dB Bandwidth		950	1050	1200	MHz
Rise Time	pulse input		350		ps
AC Low Frequency Cutoff			260	300	kHz
Output IP3			28		dBm
2nd Harmonic	$P_{out} = 0$ dBm		-40		dBc
	$P_{out} = -10$ dBm		-53		dBc
3rd Harmonic	$P_{out} = 0$ dBm		-45		dBc
	$P_{out} = -10$ dBm		-47		dBc
Noise Spectral Density	1 MHz – 1400 MHz		-130	-125	dBm/Hz
	$>$ 1400 MHz			-150	dBm/Hz
Noise Equivalent Power (NEP)	1 MHz – 1400 MHz, 1550 nm		20	35	$\mathrm{pW}/\sqrt{\mathrm{Hz}}$
Output Impedance			50		Ω
Optical Characteristics					
Input Wavelength Range		1000		1700	nm
Transimpedance Gain	wavelength 1550 nm		3500		$\mathrm{V/W}_{optic}$
	wavelength 1310 nm		3300		$\mathrm{V/W}_{optic}$
Common Mode Rejection Ratio		25	30		dB
Maximum Input Power	(damage threshold)	10			mW

Typical Performance Characteristics

Frequency response: RF output power versus frequency



Test conditions: Light input 100 μW at 1310 nm, modulated via EOM.