

1 GHz Dual-Balanced InGaAs Low Noise Photodetector

Features

- High transimpedance gain: 3 500 V/W
- Low noise: below -130 dBm/Hz
- NEP: $20 \text{ pW}/\sqrt{\text{Hz}}$ typ.
- 1 GHz bandwidth
- AC coupled; low cutoff below 300 kHz (30 kHz to 5 MHz on request)
- Wavelength range: 1000 nm to 1650 nm
- Fiber Coupled: FC receptacles
- Output: 50Ω SMA plug
- Wide range single supply: 11 to 15 V



Typical Application

- Interferometry
- High speed Swept-Source OCT imaging
- Balanced (differential) detection
- Can be used single-ended as well

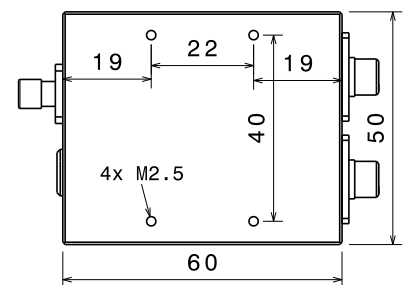
General Description

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

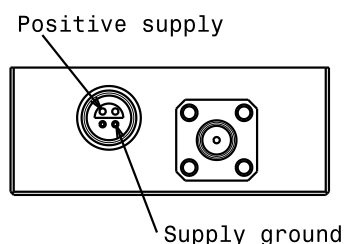
The WL-BPD1GA comes in a rugged aluminum case with two FC fiber receptacles and a 50Ω SMA output. It operates from a single 11–15 V DC supply. OEM versions are available upon request.

Mechanical Properties

- Fiber coupling: FC receptacles for FC/PC and FC/APC connectors
- RF output: SMA (female)
- Supply voltage input: Push-pull LEMO plug (included with diode)
- Small form factor: $50 \times 60 \times 20$ mm (weight: 105 g without cable)
- Mounting: 4x M2.5 threaded holes on bottom (screw length 4 mm)



Electrical Connectors



Supply connector (front view). The case is electrically connected to ground. There are two types of supply cable, one has 2 wires (new cable) and one has 5 wires (old). The corresponding color scheme of these cables is:

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

Wieserlabs GmbH (formerly UG)
 82377 Penzberg, Germany
 web: www.wieserlabs.com
 e-mail: info@wieserlabs.com

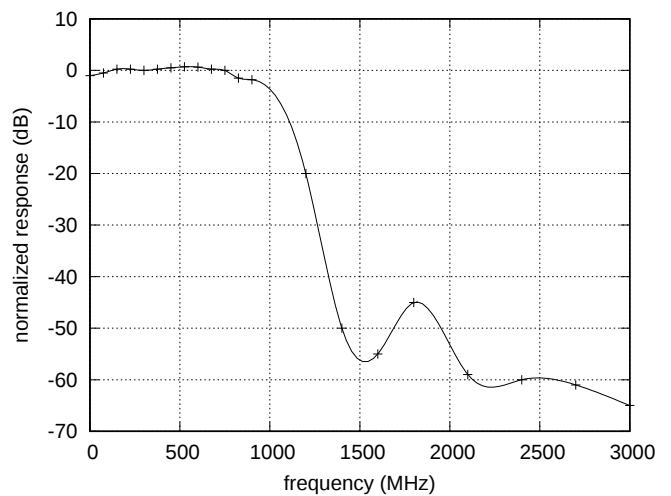
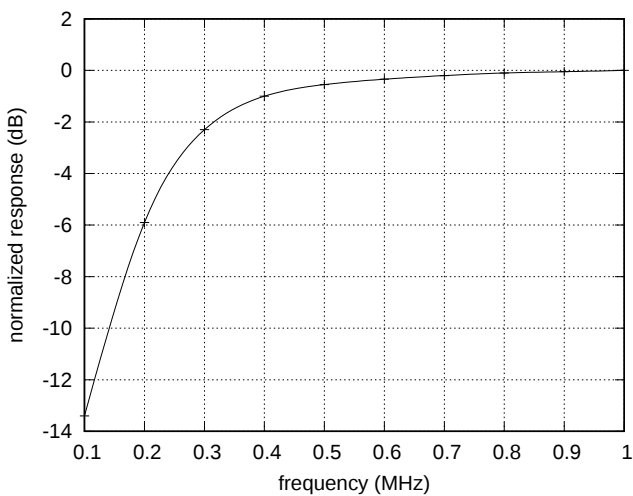
The information provided in this data sheet is believed to be accurate and reliable. However, no responsibility is assumed for its use, for inaccuracies and omissions, nor for any infringements of patents or other rights of third parties that may result from its use. Prices and specifications are subject to change without notice. Trademarks and registered trademarks are the property of their respective owners.

Specifications

Parameter	Conditions	Min	Typ	Max	Units
DC Characteristics					
Supply Voltage (+V _S)		11	12	15	V
Supply Current			110		mA
AC Characteristics					
3dB Bandwidth		950	1000	1100	MHz
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 – 1000 MHz, 1550 nm		20	35	pW/ $\sqrt{\text{Hz}}$
Output Impedance			50		Ω
Optical Characteristics					
Input Wavelength Range		1000		1650	nm
Transimpedance Gain	wavelength 1550 nm		3 500		V/W _{optic}
	wavelength 1310 nm		3 300		V/W _{optic}
Common Mode Rejection Ratio		25	30		dB
Maximum Input Power	(damage threshold)	10			mW
Environmental Characteristics					
Operating Temperature Range ¹	non-condensing	-20		+80	°C
Storage Temperature Range	non-condensing	-20		+120	°C

Typical Performance Characteristics

Frequency response: RF output power versus frequency



Test conditions: Light input 100 μW at 1550 nm, modulated via EOM.

¹Test show operation up to 120°C ambient temperature for multiple days without failure, contact us for more information.