

The GHBD Balanced Photoreceiver is designed for high-speed analog and digital light detection, offering exceptional performance with a differential gain of approximately 2800 V/W and a bandwidth of up to 35 GHz. It features two waveguide-integrated PIN photodiodes and a limiting amplifier in a compact SMD package with matched fiber lengths. The limiting amplifier delivers a differential output voltage swing of approximately 600 mV. The device achieves excellent electrical and optical phase propagation with a total skew of less than 5 ps between balanced signal paths and 10 ps total skew for all fiber pairs. Independent DC output voltage monitoring is available for OUTN and OUTP, and each amplifier path includes a threshold control at the linear amplification stage to optimize the differential output signal. This photoreceiver is ideal for applications requiring high sensitivity and high-speed balanced detection.

## Features

- 100kHz to 35 GHz Bandwidth
- Contains 2 Balanced PIN/LA
- Hermetically Sealed Package
- Very Low Skew
- Dual Optical Fiber Inputs with Length Matched
- AC-Coupled output with Threshold Control

## Applications

- High Speed Sensing
- Transponder Linear Receiver up to 30 GHz
- 30 GHz Analog RFoF Link



## Specifications

Parameter	Min	Typical	Max	Unit
Wavelength Range	1500		1650	nm
Optical Input Power	-10	4	9	dBm
Bandwidth (-3 dB)	27	31	35	GHz
Low Frequency Cut-Off			100	KHz
Bit Rate (NRZ)		43		Gbit/s
Sensitivity		-10	-5	dBm
Photodiode Dark Current		5	300	nA
Photodiode DC Responsivity	0.5	0.6	0.75	A/W
Differential Conversion Gain	2000	2800		V/W
Differential Output Voltage Swing		600		mV
Skew <sub>Rx</sub>		1	5	ps
Skew <sub>Set</sub>			10	ps
Equivalent Input Noise Density			80	pA/√Hz
Optical Return Loss	30			dB
Polarization Dependent Loss		0.1		dB
PD Reverse Bias Voltage	2		2.75	V
Amplifier Supply Voltage	-5.5		-4.7	V
Amplifier Adjustment Voltage	-5.5		0.3	V
Amplifier Threshold Control Voltage	-7		7	V
Electrical Return Loss (0.1 to 25 GHz)		< -10		dB
Impedance		50		Ω
Output Coupling		AC coupling		
Noise Equivalent Power (NEP) (@ 1 GHz)		17		pW/√Hz
Operating Temperature	-30		+75	°C
Storage Temperature	-50		+85	°C
Operating Humidity		85		%
Supply Current		90		mA
Power Consumption		0.5	0.6	W
RF Connector		Dual GPPO		
ESD, All Other Pins	-500		500	V

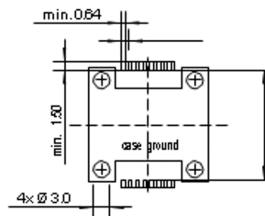
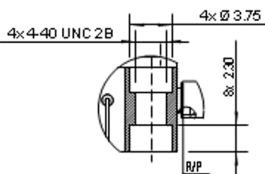
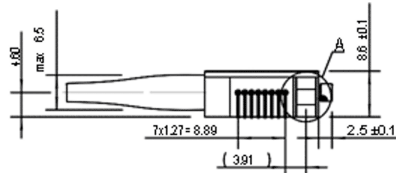
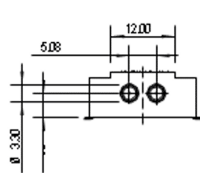
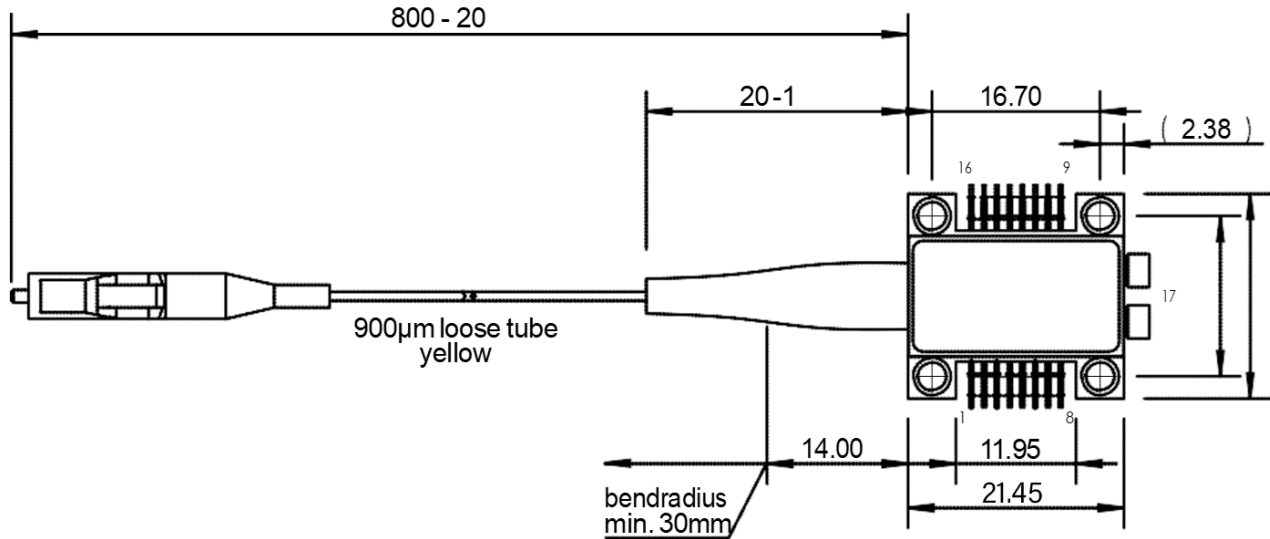
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# Fiber Coupled 35 GHz Balanced Photoreceiver



## DATASHEET

### Dimensions (mm)



\*Product dimensions may change without notice. This is sometimes required for non-standard specifications.

### Application Notes

Electrostatic discharge (ESD) will cause permanent damage to the product. Please avoid any ESD to the input pins or output connector. Use standard ESD protective equipment when handling this product.

Temperature and fiber restrictions are as follows: Lead soldering: 250°C for no more than 10 seconds Fiber feed-through tube:

- 120°C
- Fiber pull force: 4.9 N
- Fiber bending radius: 1 inch or less

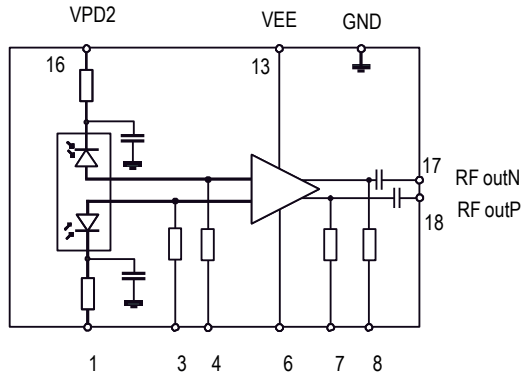
Exceeding these conditions can cause permanent damage to the device.

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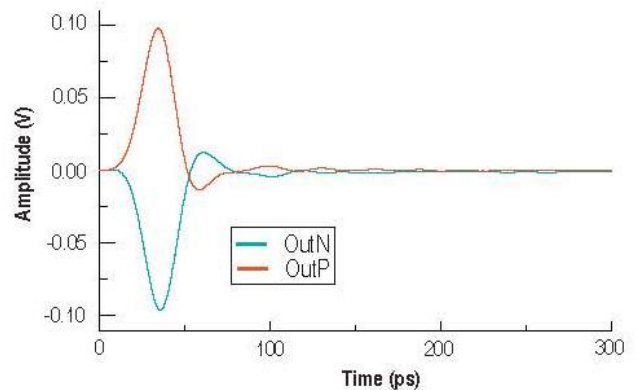
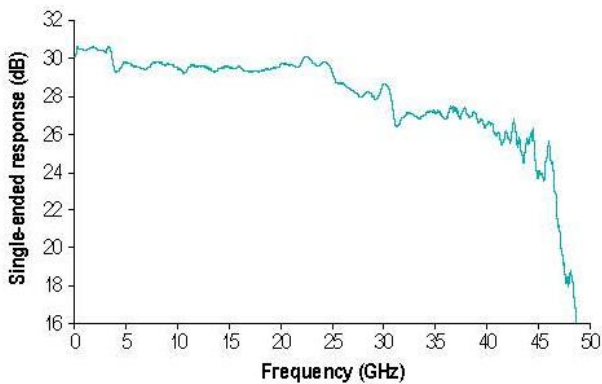
## DATASHEET

### Block Diagram/ Pin Description



Pin#	Symbol	Description
1	V <sub>PD1</sub>	Photodiode 1 supply
3	V <sub>THCN</sub>	Amplifier threshold control negative
4	V <sub>THCP</sub>	Amplifier threshold control positive
6	V <sub>adj</sub>	Amplifier adjustment control
7	V <sub>OUTPDC</sub>	DC voltage monitor on OUTP
8	V <sub>OUTNDC</sub>	DC voltage monitor on OUTN
16	V <sub>PD2</sub>	Photodiode 2 supply
17	outN	Rf-output negative – GPPO connector
18	outP	Rf-output positive – GPPO connector
9, 10, 11, 12	N/C	Not connected
13	V <sub>EE</sub>	Amplifier supply voltage
2, 5, 14, 15	GND	Ground

### Frequency Response / Pulse Response



### Ordering Information

Prefix	Detector Type	Wavelength Range	Bandwidth	TEC	Module*	Configuration	Connector
GHBD-	PIN = 1 APD = 2	1300-1600nm = 1	30GHz = 30	Non = 1	Non = 1 Yes = 2	Standard = 11	LC/PC = 1 FC/PC = 2 FC/APC = 3 Special = 0

\* Module contains driver and power supply.

## Laser Safety

This product meets the appropriate standard in Title 21 of the Code of Federal Regulations (CFR). FDA/CDRH Class 1M laser product. This device has been classified with the FDA/CDRH under accession number 0220191. All versions of this laser are Class 1M laser products, tested according to IEC 60825-1:2007 / EN 60825-1:2007. An additional warning for Class 1M laser products. For diverging beams, this warning shall state that viewing the laser output with certain optical instruments (for example eye loupes, magnifiers, and microscopes) within a distance of 100 mm may pose an eye hazard. For collimated beams, this warning shall state that viewing the laser output with certain instruments designed for use at a distance (for example telescopes and binoculars) may pose an eye hazard.

Wavelength = 1.3/1.5  $\mu\text{m}$ .

Maximum power = 30 mW.

