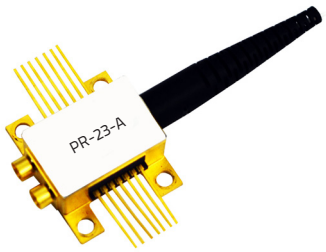
Kokyo
株式会社光響
住所：京都市下京区烏丸通四条下ル水銀屋町637番地 第5長谷ビル2階
Email : info@symphotony.com
TEL : 070 - 6925 - 5558
Web : https://www.symphotony.com/
FAX : 075 - 320 - 1604

Optilab
photonics for the future

PR-23-A



23 GHz Linear PhotoReceiver

The Optilab PR-23-A is a linear photo receiver designed for analog applications to 23 GHz. It features high linear TIA gain and dual GPPO RF output. This compact photo receiver contains a surface coupled coplanar waveguide PIN photodiode and has a linear trans-impedance amplifier within a 14-pin butterfly package. With an integrated variable gain amplifier (VGA), PR-23-A offers two gain control modes: Manual Gain Control (MGC) mode or Automatic Gain Control (AGC) mode. In MGC mode, PR-23-A provides a linear conversion gain up to 1500 V/W. In AGC mode, the gain is automatically adjusted to deliver a constant differential output voltage up to 1200 mV. The high conversion gain and low input referred noise makes this linear receiver well suitable for high speed analog applications.

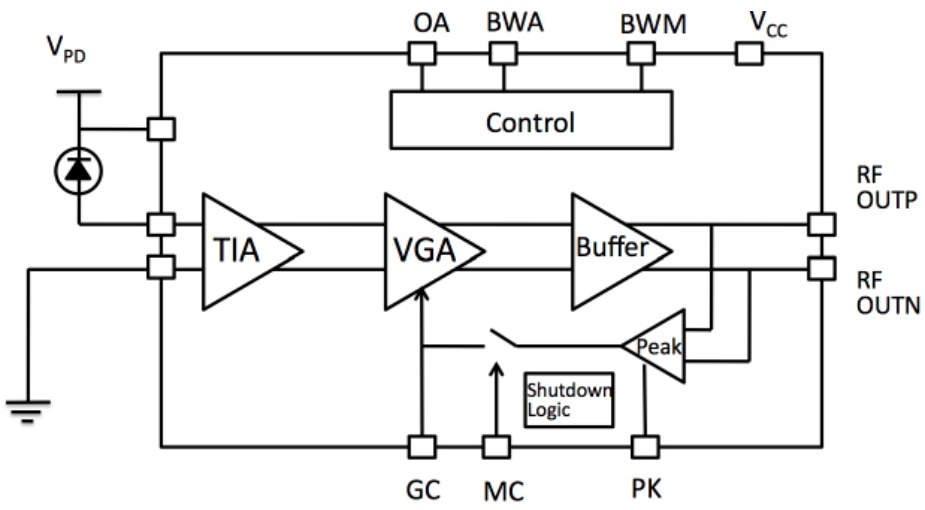
Features

- Adjustable bandwidth to 23 GHz
- Linear TIA with integrated VGA
- 14 pin mini-DIL package
- Dual GPPO for differential RF output
- MGC and AGC mode

Applications

- Linear receiver up to 23 GHz
- 23 GHz analog RFoF link
- Low noise analog heterodyne detection
- Transponder and line card designs

Functional Diagram



23 GHz Linear Photo Receiver

OPTIONS

PR-23-A-xx

xx FA: FC/APC
LA: LC/APC

TECHNICAL INFO

For technical info and support:

sales@optilab.com

www.optilab.com

WEB ORDER

To order, please visit OEQuest.com.

OEQuest.com

Optilab Advantage

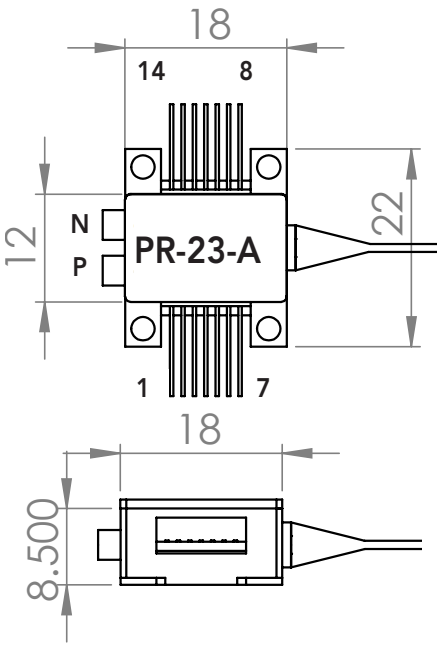
- Innovation
- Performance
- Quality
- Customization
- Warranty

General Specifications	
Optimized Operating Wavelength	950 nm to 1650 nm
Optical Input Level	+4 dBm max.
S21 3 dB Bandwidth	23 GHz typ.
Dark Current @ 25° C, 3.3V	5 nA typ.
Conversion Gain	1500 V/W typ., 1300 V/W min
Optical Return Loss	30 dB typ.
Optical PDL @1550 nm	0.25 dB max.
PD Reverse Bias Voltage	3.3 V ± 0.2V
TIA Supply Voltage	3.3 V ± 0.2V
Output Return Loss	8 dB @ 20 GHz
Differential Output Voltage	Up to 1200 mVpp
Impedance	50 Ω
Output Coupling	DC (external AC coupling required)
Impulse Response	22 ps typ.
Equivalent Input Noise Density	100 pA/√Hz max.
Mechanical Specifications	
Operating Temperature	0 °C to +75 °C
Storage Temperature	-40 °C to +85 °C
Operating Humidity	85% max
Supply Current	87 mA typ., 93 mA max.
Power Consumption	275 mW typ., 307 mW max.
Housing Dimension	18 mm x 22 mm x 8.5 mm
Fiber Connector	FC/APC or LC/APC
Optical Fiber	SMF-28
Package Type	14 pin butterfly min-DIL
RF Connector	Dual GPPO

Absolute Maximum Ratings	
PD Reverse Bias Voltage	4.5 V
Input Optical Power	6 mW
Maxium Current	93 mA
Continuous Input Current	-1.5 mA to 5 mA
ESD, Input and Output Pins	1000 V min.
ESD, All Other Pins	2000 V min.
Latch up	JESD78 Class 2
Humidity	85%

23 GHz Linear Photo Receiver

Mechanical Drawing

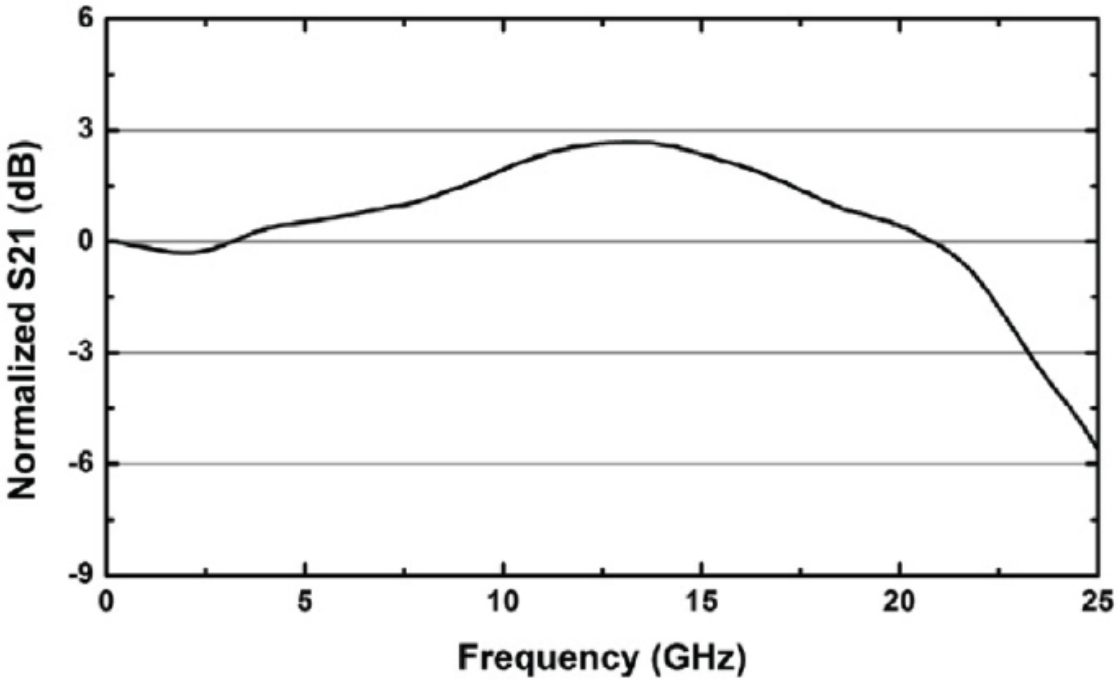


Unit: mm

14-pin Butterfly Package

Pin 1, 5, 10, 14	Vcc	+2.8 to 3.3 V, abs max current is 93 mA
Pin 2	BWM	Bandwidth Adjust, Sign.
Pin 3	BWA	Bandwidth Adjust, Magnitude.
Pin 4	OA	Output Amplitude Adjust. 0-3.3 VDC adjustment for AGC mode.
Pin 6, 9	GND	Ground
Pin 7, 8	VPD	PD Cathode Connection.
Pin 11	GC	Gain Control. 0-3.3 VDC adjustment for MGC mode. Set to FLT in AGC mode.
Pin 12	MC	Mode Control. GND: MGC mode; FLT: AGC mode; Vcc: Shutdown.
Pin 13	PKD	Peak Detector Output
	OUTP	Positive RF Output, DC coupled out
	OUTN	Negative RF Output, DC coupled out

S21 Frequency Response



PR-23-A Product Family

Evaluation Board (PR-23-EVAL)

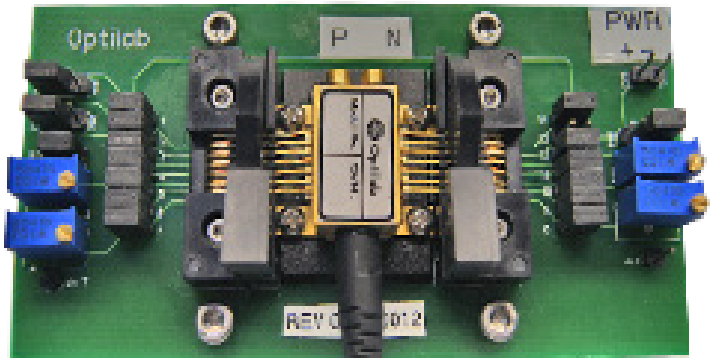
Evaluation board for the PR is designed for ease of testing. It provides convenient access to all 14 pins and the data output ports. Utilizing a zero-insertion force configuration, the BPR can be mounted without the need for soldering. Different settings can be easily configured with the provided jumpers. The evaluation board can be powered up with a single +3.3V power with the provided power cable.

Bandwidth Setting Table

BWM (Pin 2)	BWA (Pin 3)	Min. Bandwidth (GHz)
GND	Vcc	13
GND	FLT	15
GND	GND	16
FLT	FLT	18
Vcc	GND	20
Vcc	FLT	20.5
Vcc	Vcc	21

Operation Mode Setting

Operation Mode	MC Setting (Pin 12)	Amplitude / Gain Adjustment
Manual Gain Control	GND	GC (Pin 11), 0 ~ 3.3V
Auto Gain Control	Floating	OA (Pin 4), 0 ~ 3.3 V
Shut Down	Vcc	N.A.



Integrated Module (PR-23-M)

For ease of installation, a fully integrated module PR-23-M is available for ordering. Here are the features of PR-23-M:

- Power and controlled via USB
- Integrated input power mornitoring
- Integrated DC blocks
- MGC/AGC selection