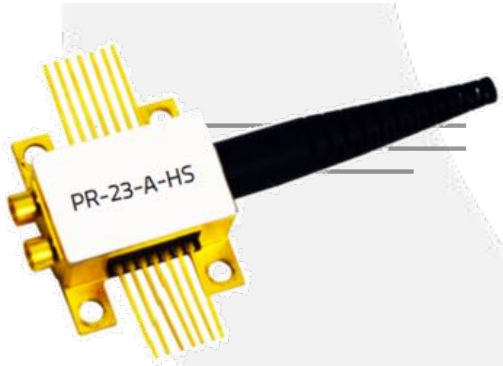
PR-23-A-HS



DEVICE

23 GHz Linear Photo Receiver, Hermetically Sealed

OVERVIEW

The Optilab PR-23-A-HS is a linear photo receiver designed for analog applications to 23 GHz. It features high linear TIA gain and dual GPPO RF output, hermetically sealed for component qualification standards. 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-HS offers two gain control modes: Manual Gain Control (MGC) mode or Automatic Gain Control (AGC) mode. In MGC mode, PR-23-A-HS 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.

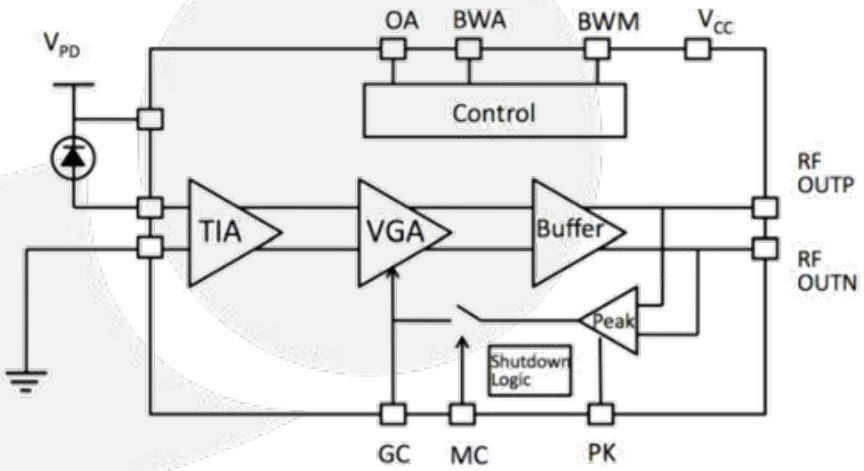
FEATURES

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

USE IN

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

FUNCTION DIAGRAM



PR-23-A-HS

SPECIFICATIONS

GENERAL

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, 3.3 V	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 ± 0.2 V
TIA Supply Voltage	3.3 V ± 0.2 V
Output Return Loss	8 dB @ 20 GHz
Differential Output Voltage	Up to 1200 mWpp
Impedance	50 Ω
Output Coupling	DC (external AC coupling required)
Impulse Response	22 ps typ.
Equivalent Input Noise Density	100 pA/√Hz max

MECHANICAL

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
Maximum 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%

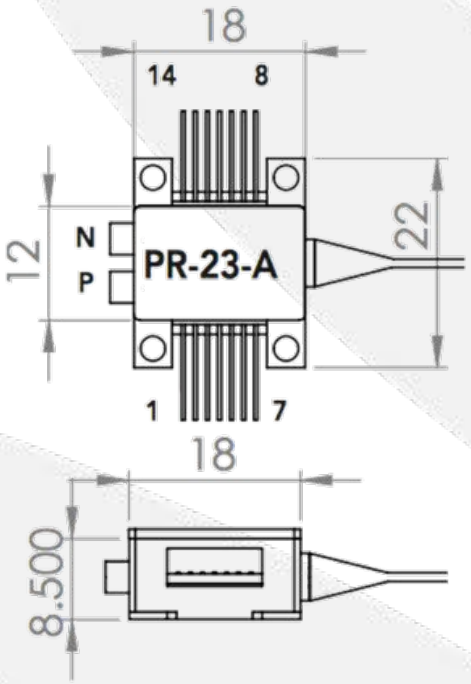
PR-23-A-HS

OPTIONS

PD-23-A-HS-xx

xx: FA: FC/APC
LA: LC/APC

MECHANICAL DRAWING

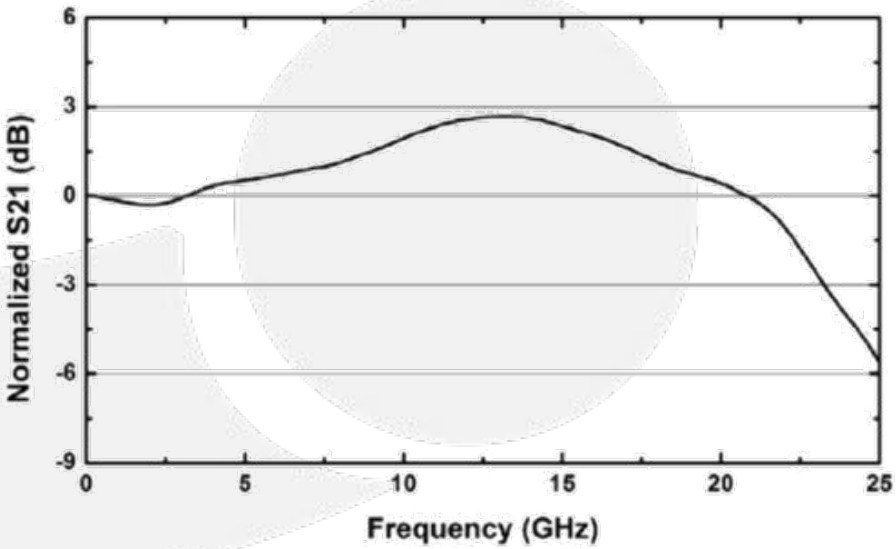


Unit: mm

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-HS

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 +3.3 V 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 a few features of the PR-23-M:

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