



PR-30-ST



DEVICE

30 GHz Linear Photoreceiver, Hermetically Sealed – Space Tested

OVERVIEW

The Optilab PR-30-ST is a linear photo receiver designed for analog applications. This compact photo receiver contains a surface coupled coplanar waveguide PIN photodiode and a linear transimpedance amplifier within a hermetically sealed 14-pin butterfly package. With an integrated variable gain amplifier (VGA), PR-30-ST offers two gain control modes: Manual Gain Control (MGC) mode or Automatic Gain Control (AGC) mode. In MGC mode, PR-30-A provides a linear conversion gain up to 2000 V/W. At a reduced gain setting, the bandwidth of PR-30-A can be increased up to 35 GHz. In AGC mode, the gain is automatically adjusted to deliver a constant differential output voltage up to 1800 mV. The high conversion gain and low input referred noise makes this linear receiver well suitable for high speed analog applications, as well as digital applications requiring linear response, e.g. QAM-16. This device has also been tested with qualification standards such as MIL-STD-883 and ESC 22900 for space applications.

FEATURES

- Adjustable 3 dB Bandwidth up to 35 GHz
- High Conversion Gain up to 2000 V/W
- Hermetically Sealed version available
- Linear TIA with Integrated VGA
- 14-pin mini-DIL package
- MGC and AGC Mode

USE IN

- Low Noise Analog Heterodyne Detection
- Transponder and Line Card Designs
- Linear Receiver up to 30 GHz
- PAM-4
- 30 GHz Analog RFoF Link

TESTS*

- Thermal Cycling
- Random Vibration
- Electro-Optical Measurement
- Radiographic Inspection
- Fine Leak Seal Tests
- Gross Leak Seal Tests
- Total Ionizing Dose
- Proton Displacement Damage

*Full Testing Report available upon request.

STANDARDS

- ESCC 22900
- MIL-STD-883





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SPECIFICATIONS

Optimized Operating Wavelength	1250 nm to 1650 nm
Optical Input Level	+4 dBm max.
S21 3 dB Bandwidth	29 GHz typ. @ max. gain
Dark Current @ 25°C, 3.3 V	5 nA typ.
Differential Conversion Gain	1500 V/W typ., 2000 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, +4.5 V max.
TIA Supply Voltage	3.3 V ± 0.2 V
Output Return Loss	< -10 dB up to 25 GHz
Differential Output Voltage	Up to 1800 mVpp
Impedance	50 Ω
Output Coupling	DC (external AC coupling required)
Noise Equivalent Power (NEP)	17 pW/√Hz @ 1GHz

GENERAL

Operating Temperature (standard)	0°C to +75°C
Operating Temperature (HS)	-30°C to +75°C
Storage Temperature	-50°C to +85°C
Operating Humidity	85%
Supply Current	90 mA typ.
Power Consumption	300 mW typ.
Housing Dimensions	18 mm x 12 mm x 8.5 mm
Fiber Connector	FC/APC standard or other
Optical Fiber	SMF-28
Package Type	14 pin butterfly min-DIL
RF Connector	Dual GPPD

MECHANICAL

ABSOLUTE MAXIMUM RATINGS

PD Reverse Bias Voltage	4.5 V
Input Optical Power	6 mW
ESD, Input and Output Pins	1000 V min.
ESD, All Other Pins	2000 V min.
Latch Up	JESD78 Class 2
Humidity	95%





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RADIATION

Total Ionizing Dose

Source	Co-60 Gamma ray
Dose Rate	36 Gy/hr
Total Dose	1000 Gy

Proton Displacement Damage

Proton Energy	34.96±3.82 MeV
Flux	1x10 ⁸ particles/(s·cm ²)
Total Fluence	1x10 ¹¹ particles/cm ²

THERMAL CYCLE

Range	-55°C to +75°C
Cycles	2
Ramp Speed	1°C/min
Stability Period	10 min

RANDOM VIBRATION

Power Spectral Density	0.3
Overall rms G	20.0
Test Duration	3min/axis

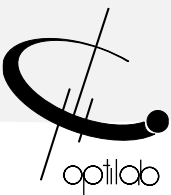
SEAL TESTS

Fine Leak

Source	He tracer gas
Result	No leak

Gross Leak

Source	Perfluorocarbon gas
Result	No Leak



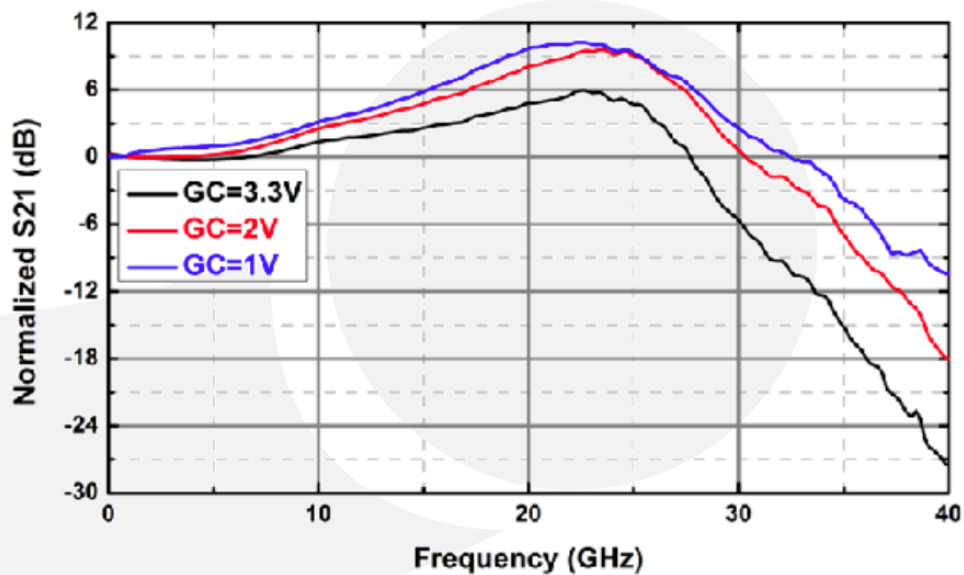


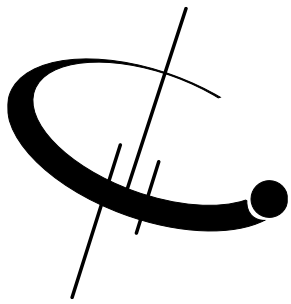
PR-30-ST

14 PIN BUTTERFLY PACKAGE

Pin Configuration		
Pin 1	BWH	Bandwidth Coarse Adjust: GND, Floating, or Vcc
Pin 2 & 12	Vcco	Vcc for output: +3.3 V
Pin 3	GC	Gain Control in MGC mode Range: GND to Vcc Floating in AGC mode
Pin 4	OA	Output Amplitude Adjust in AGC mode. Range: GND to Vcc
Pin 5 & 8	Vcci	Vcc for input: +3.3V
Pin 6	MC	Mode Control: GND = MGC mode, Floating = AGC mode
Pin 7	VPDS	PD Cathode Connection + 4.5V abs. max
Pin 9, 11 & 13	GND	Ground connection
Pin 10	N.A.	Reserved Pin, Float
Pin 14	BWL	Bandwidth Fine Adjust: GND, Floating, or Vcc

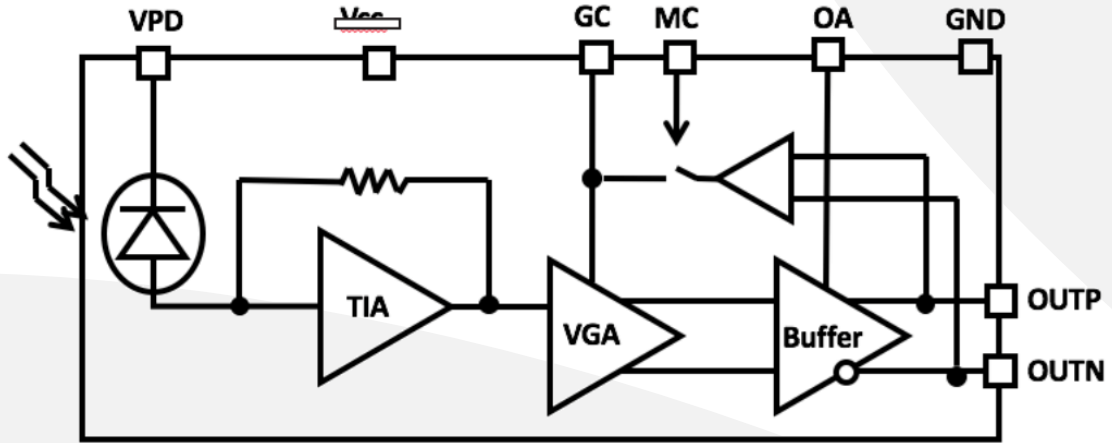
DUAL CHANNEL S21 FREQUENCY RESPONSE





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FUNCTIONAL DIAGRAM



MECHANICAL DRAWING

