

CIPRM

Coherent InGaAs PIN balanced receiver module



In the CIPRM balanced optical receiver Excelitas has the best features of high-performance InGaAs photodiodes and a low-noise, high-gain transimpedance amplifier to offer a practical solution to detect small changes above the interfering noise floor of an incoming signal. The advantage is that the common optical noise is cancelled out.

This receiver incorporates two low-noise photodiodes with well-matched responsivity, in order to ensure a high common mode rejection ratio (CMRR). It has two optical inputs (single mode fiber pigtailed in the -110 model and FC receptacles in the -210 model), an RF output, electrical supply inputs and two photo-current monitor outputs.

The CIPRM modules come in a robust casing with flange mounting holes for securing the module to working surfaces or platforms. Combined with a wide operating temperature range, and excellent EMI characteristics, the CIPRM can work in some of the toughest and harshest environments.

Excelitas' series of optical balanced receiver modules are designed and built to be fully compliant with the European Union's RoHS Directive 2015/863/EU.

Key Features

- Spectral range 800 - 1650nm
- 200MHz bandwidth
- High performance InGaAs photodiodes and TIA
- Matched responsivity
- Photo-current monitor outputs
- Rugged and Robust
- RoHS compliant
- Enhanced EMC/EMI performance

Applications

- Wind LiDAR
- FMCW LiDAR
- Optical coherent tomography
- Heterodyne Detection
- Spectroscopy
- Optical delay measurement
- Ellipsometry
- Ultra low signal detection

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Table 1: receiver specifications @ Tcase = 22 °C, into a 50Ω load, unless otherwise specified

Parameter	Typical specification	Notes
Wavelength Range	800-1700nm	
Detector Material	InGaAs	
Detector Diameter	0.1mm	
Detector Responsivity (Peak)	0.95 (A/W)	@1550nm
Optical Input	FC/APC	For -110, SM fiber, 9/125 with 900μm buffer
Saturation Optical Power	200μW	CW or average power on one detector, (unbalanced)
	10mW	When average power is the same on both detectors (balanced)
Maximum Input Range	0.35mW	Differential signal
	10mW	Absolute maximum, differential signal
Integrated noise	100nW	NEP*VBW (at input)
Photo-current Monitoring Coefficient	2.85V/mW	
Transimpedance Gain	32x10 ³ V/A	
Conversion Gain, Maximum	30x10 ³ V/W	
Bandwidth (-3 dB)	2.5kHz - 200MHz	
Rise Time	2ns	
Common Mode Rejection	30dB	
NEP	7 pW/vHz	Calculated
Overall output voltage noise	4mVrms	Measured
Output Impedance	50Ω	
Output Connector	SMA	
Maximum RF Power	+11dBm in 50Ω	
Power Supply Requirements	±12V DC	Supply voltage
	I _{+12V} = 32mA I _{-12V} = 5mA	Supply current

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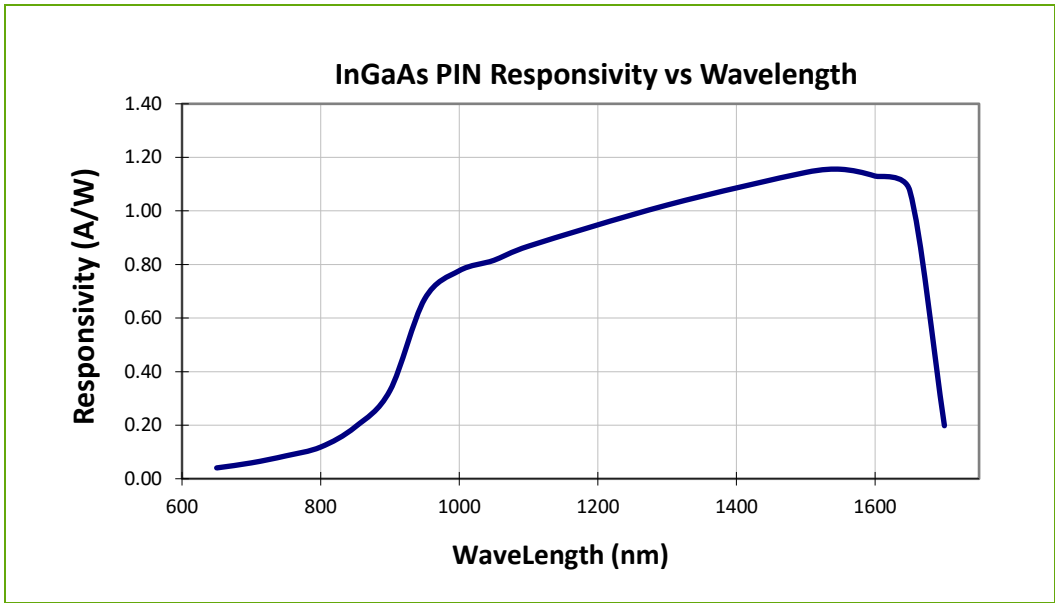


Figure 1
Typical Responsivity vs. Wavelength

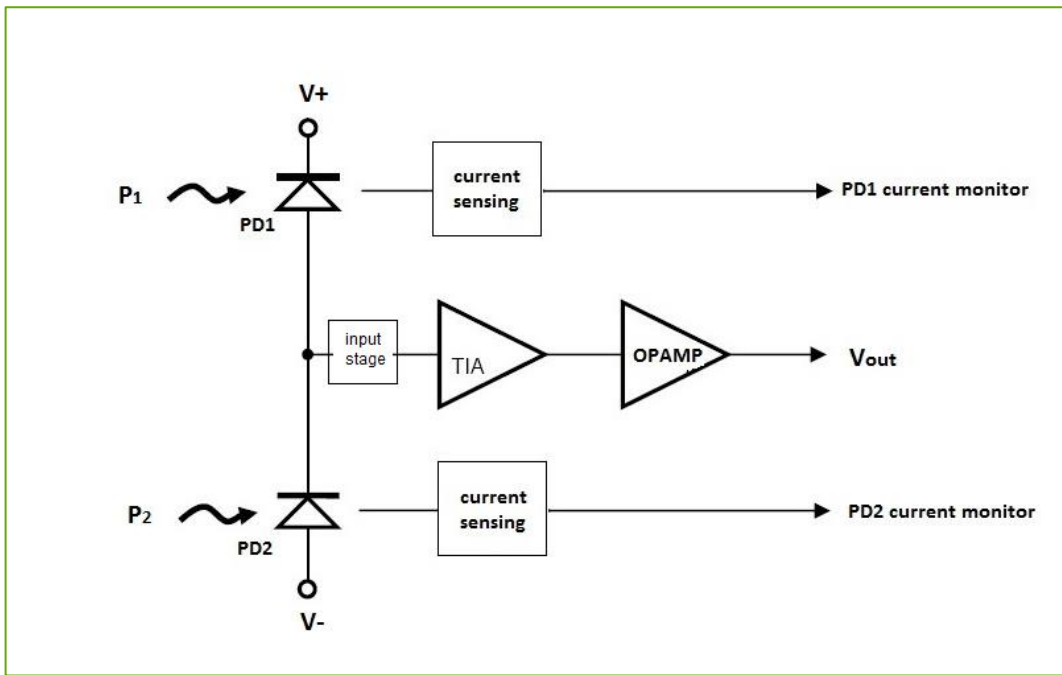


Figure 2
Electrical block diagram

Table 2: Ordering Guide

Part Number	Description
CIPRM-110	Fiber pigtailed module, 1 meter single mode fiber
CIPRM-210	FC receptacle module
1342-2	Shielded power cable

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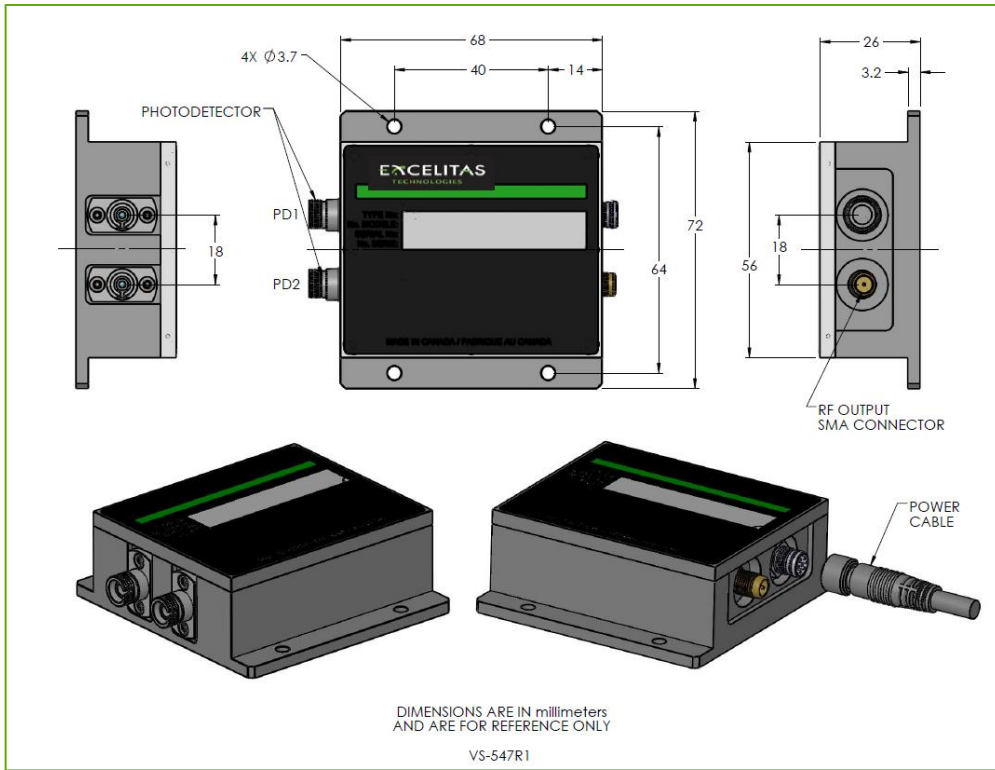


Figure 3
Module mechanical outline, CIPRM-210 receptacle version

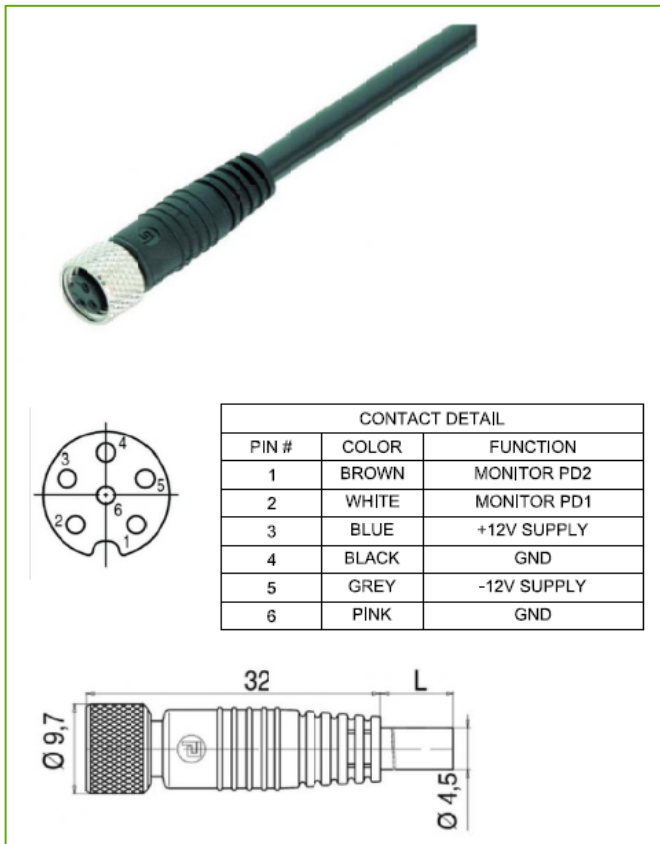


Figure 4
Shielded power cable connection detail

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RoHS Compliance

The CIPRM balanced receiver module is designed and built to be fully compliant with the European Union Directive 2015/863/EU – Restriction of the use of certain Hazardous Substances (RoHS) in Electrical and Electronic equipment.



About Excelitas Technologies

Excelitas Technologies is a global technology leader focused on delivering innovative, customized solutions to meet the lighting, detection and other high-performance technology needs of OEM customers.

From analytical instrumentation to clinical diagnostics, medical, industrial, safety and security, and aerospace and defense applications, Excelitas Technologies is committed to enabling our customers' success in their specialty end-markets. Excelitas Technologies has approximately 5,000 employees in North America, Europe and Asia, serving customers across the world.

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