RXM42AF: 42 GHz Amplified Photoreceiver

Features

- Self-Contained 42 GHz Photoreceiver
- 800 – 1650 nm InGaAs Detector
- USB Power Supply Included
- PIN/TIA/VGA Configuration
- AC-Coupled Differential Outputs
- SMF-28 Fiber with FC/PC Input Connector
- Linear Response

Applications

- Test and Measurement
- High-Speed Communications
- Instrumentation O-E Front End



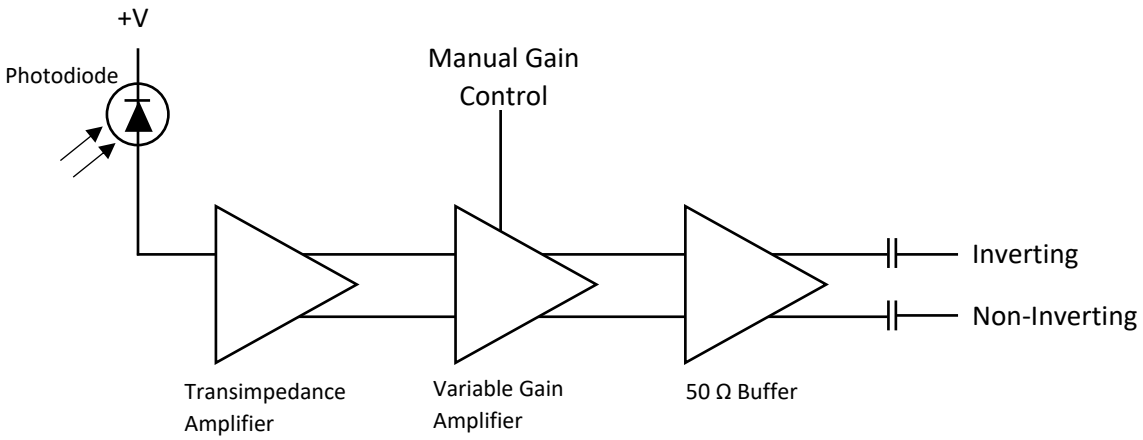
RXM42AF

Description of Model

The RXM42AF provides an easy to use 42 GHz amplified photoreceiver with SMF-28 fiber input for general laboratory use. The self-contained unit comes with a USB-type power supply and full photocurrent monitoring capability via an analog output as well as a digital display. The unit also provides variable gain with a consistent response across gain. Optical input is through an FC/PC bulkhead-type connector, while the differential outputs are AC-coupled through 2.92 mm coaxial connectors (K). Custom units with FC/APC connectors also available upon request.

- **RXM42AF** 42 GHz Photoreceiver Instrument, Single Mode Input Fiber, FC/PC Connector

Block Diagram



Operating Conditions

Parameter	Min	Typ.	Max	Unit	Note
Operating Temperature	10	-	50	°C	-
Storage Temperature	0	-	70	°C	-
Relative Humidity	-	-	85	%	Non-Condensing
Optical Input Power	-	-	0	dBm	3 dBm Peak at 50% Duty Cycle
Abs. Max Input Power	-	-	10	dBm	7 dBm average at 50% Duty Cycle

O-E Specifications

All specifications are typical at 25 °C, at 1550 nm, and into 50 Ω unless noted.

Parameter	Min	Typ.	Max	Unit	Note
Wavelength Range	800	-	1650	nm	-
-3 dB Bandwidth		42	-	GHz	Gain = 6, Bandwidth may be decreased for shorter wavelengths
Low Frequency Cutoff	-	45	-	kHz	AC Coupled
Responsivity		0.6		A/W	-
Conversion Gain (Differential, Adjustable)	100	-	2700	V/W	-
Noise-Equivalent Power	-	23	-	pW/√Hz	At Maximum Gain Setting
Optical Return Loss		-15		dB	-
Output Swing (Differential)		600		mV	Linear to 450 mV, THD = 3%
Electrical Return Loss	-	-10	-	dB	To 40 GHz
Current Monitor Output	-	200	-	mV/mA	DC Level Proportional to Avg. Photocurrent

Mechanical Specifications

Parameter	Value
Fiber Connector	2.0 mm Narrow Key FC/PC (FC/APC Available Upon Request)
Internal Fiber Type	SMF-28
Unit Dimensions	106.4 x 61.4 x 48.7 mm
RF Output Connectors	Dual 2.92 mm (K) Jacks; 8 in·lb Torque Spec.
Current Monitor Connector	SMA Jack; 5 in·lb Torque Spec.

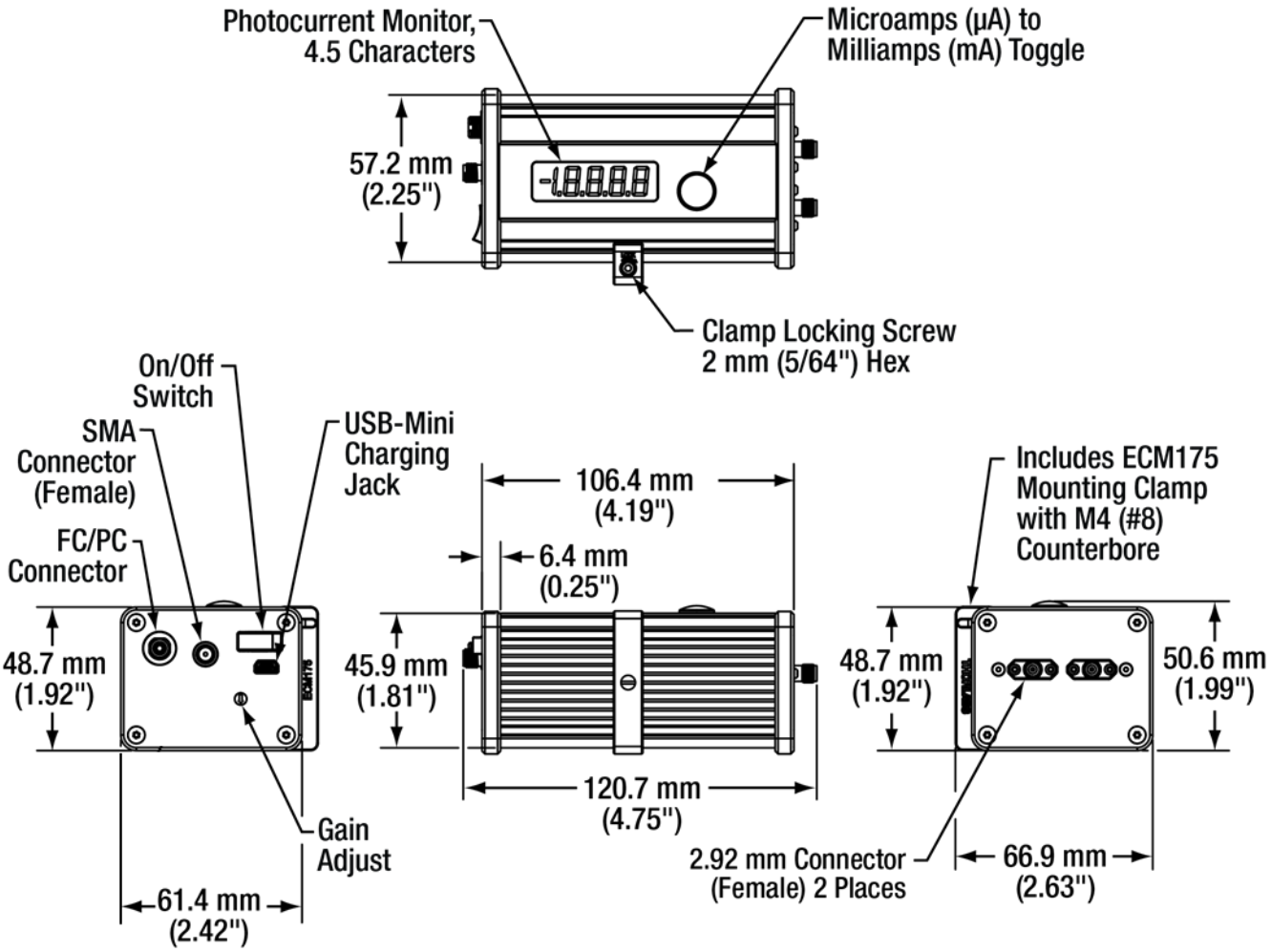


Input Panel



Output Panel

MECHANICAL DRAWING



Be sure to observe all ESD precautions. The components inside this instrument are ESD sensitive. Take all appropriate measures to discharge personnel and equipment before making any electrical connections to the unit. This also applies to coaxial cables that easily accumulate capacitive charge.

Operational Sequence

1. Make sure device is mounted firmly as desired and the RF outputs are connected. Do not over torque the RF connectors. Thorlabs offers an 8 in·lb, 5/16" hex torque wrench suitable for securing this connection.
2. Connect the USB power cable and switch the unit ON
3. Couple the optical input signal to the unit via the FC connector.
   NOTE: Be sure to not exceed the maximum optical input power rating
4. Operate the device, then adjust the input level and gain as necessary.
5. To power down, remove optical input first, then turn the switch OFF

Additional Considerations

- **Optical Input Connector**: Clean the FC input connector before every connection. This is the number one source of reduced sensitivity. Keep the FC connector capped when not in use. Input fiber should be SMF-28 or equivalent. Ensure the average input optical power does not exceed the absolute maximum of 10 dBm.
- See the graphs on the next page of this data sheet to see how the controls affect the output response.
- Adjusting the gain allows the output swing to be matched to the next device in the signal chain and optimize the signal-to-noise ratio.
- The Monitor Output provides a DC signal level that is proportional to the photocurrent. Use any standard, high impedance voltmeter to measure this voltage.
- Note that the linear response of the device is limited to an output swing 450 mV differential (for < 3% THD).
  Output swing can be calculated by multiplying the peak-peak input power by the conversion gain.

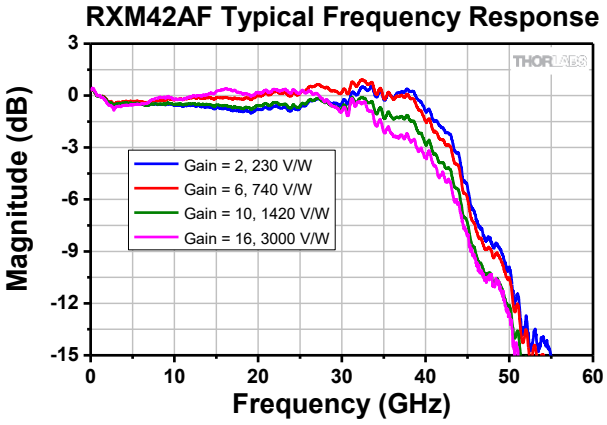


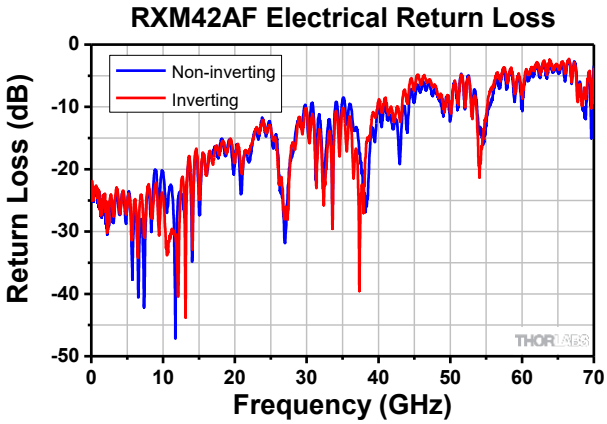
RXM42AF Output Panel

Typical Performance Graphs

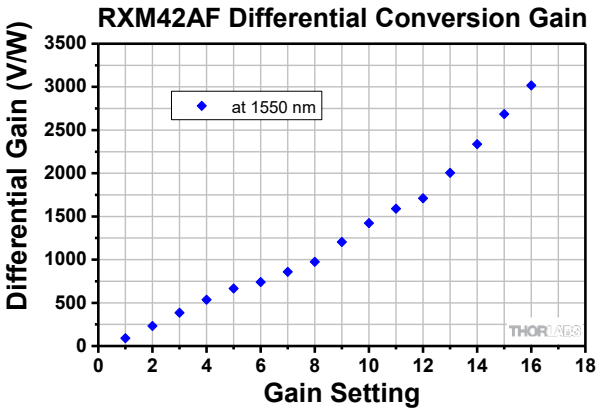
The amplifier gain graph shows the total gain of the combined internal stages. The performance of each detector is factory tested. Please contact Tech Support if you would like to receive a data file containing these test results. Contact information can be found at www.thorlabs.com/locations.

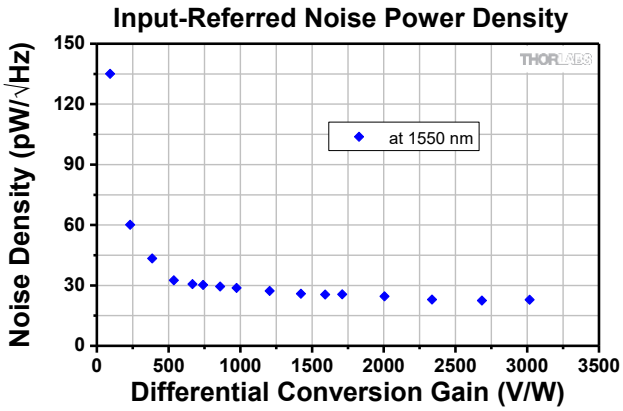
The adjustment pots on the input panel of the instrument directly control the internal voltages that affect the gain performance.

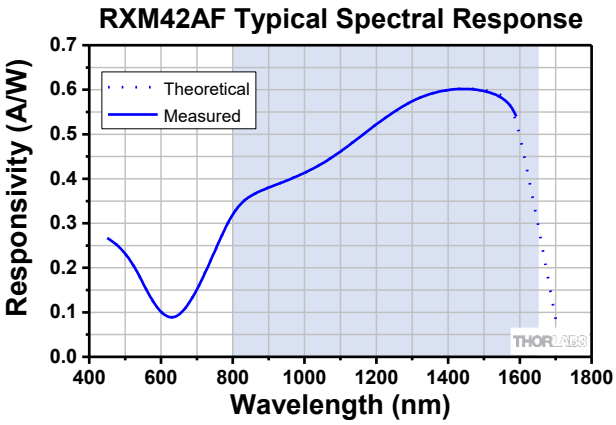




Frequency response data taken at 1550 nm.







PRECAUTIONS



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MANUFACTURING AND COMPLIANCE

Manufactured by: Thorlabs Inc., Ann Arbor, MI 48103 USA

All specifications are subject to change without notice.

