

The FORX Linear Photoreceiver is designed for high-speed and high sensitivity analog and digital applications, featuring a surface-coupled coplanar waveguide APD photodiode and a linear transimpedance amplifier within a hermetically sealed package. Its high conversion gain and low input-referred noise ensure exceptional linearity and precision.

For added convenience, Agiltron offers a driving PCB for easy integration and a metal box protective package to safeguard against ESD in laboratory environments, both come with a specially designed low noise power supply.

Features

- High Data Rate Capability: 2.5 Gbit/s
- APD or PIN Photodetector
- Fully Operational Through the 1.3 μm to 1.55 μm Wavelength Range
- Typical Sensitivity -34 dBm (APD), -25 dBm (pin)
- >25 dB Typical Dynamic Range
- High-Performance GaAs Preamplifier
- Compact, Butterfly Package
- Single-Ended or Differential Outputs

Applications

- Line Terminal Equipment
- High-Speed Networks up to 2.5 Gbit/s
- SONET OC-48 and SDH STM-16 Telecom App
- Extended Reach Datacom and Telecom App
- Digital Video



Specifications

Parameter	Min	Typical	Max	Unit	
Negative Supply Voltage	0		-6.0	V	
Optical Input Power			3	dBm	
Operating Case Temperature	-20		65	°C	
Storage Temperature	-40		85	°C	
Lead Soldering Temperature			250	°C	
Lead Soldering Time			10	s	
Power Supply Voltages:	Negative Supply	-5.46	-5.2	-4.94	V
	APD Bias Supply [2]	35		85	
Power Supply Currents:	Negative Supply		120	160	mA
	APD Bias			4	
Power Dissipation		0.6		W	
Small Signal (<10 μA) Transimpedance [4]	5	10		kΩ	
Large Signal (>100 μA) Transimpedance [4]		0.5	0.7	kΩ	
Input Noise Current (100 kHz—2.5 GHz)		250	300	nA _{RMS}	
Output Return Loss	10	15		dB	
Wavelength Range	1.25		1.6	μm	
Sensitivity [4]	Gain = 12		-34	dBm	
	Gain = 3		-32	dBm	
Maximum Optical Input Power [4]	-3			dBm	
High-frequency Cutoff at -3 dB from Midband Response	1.4	1.7	2.3	GHz	
Maximum Reflectance			-27	dBm	

Notes:

[2]. The gain = 12 APD voltage at 25 °C is supplied with each device. For optimum performance, VAPD must be set within 50 mV of the specified value. VAPD needs to be temperature compensated to maintain constant gain over operating temperature. The nominal compensation is 0.18%/°C.

[3]. Transimpedance, $TZ = \frac{V_{D-P}}{I_{PH(Avg)}}$, where $I_{PH(Avg)}$ is the average photodiode current.

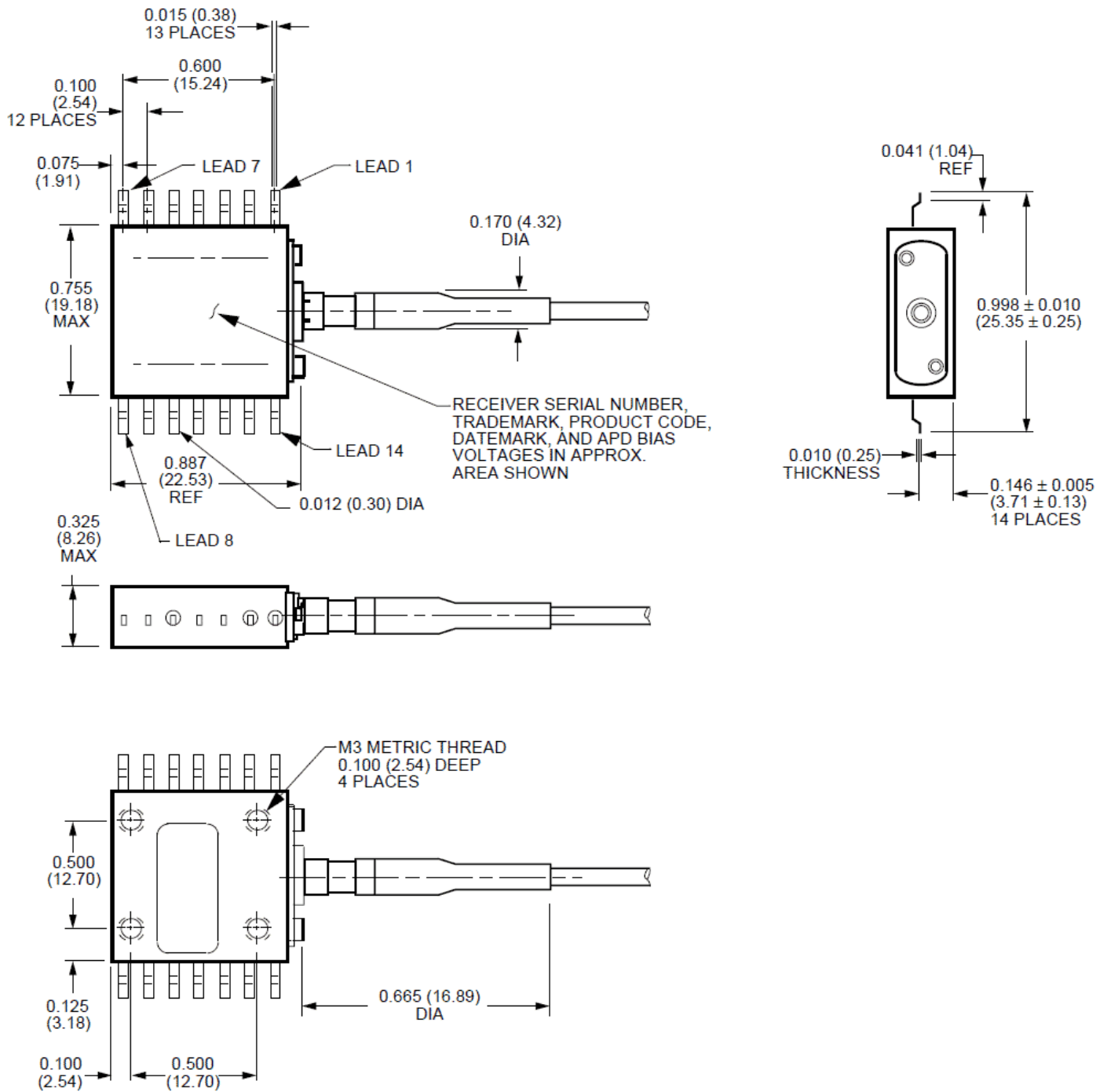
[4]. 2.5 Gb/s, 2²³ -1 PRBS, 3 x 10⁻¹¹ BER

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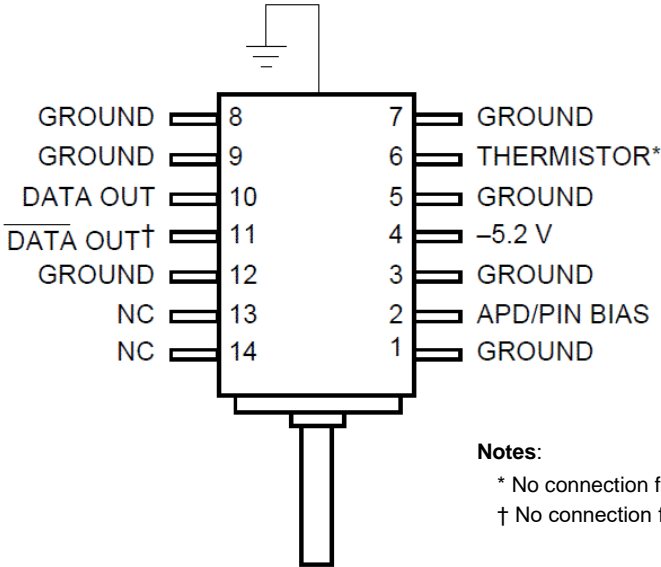
Dimensions (mm)



*Product dimensions may change without notice. This is sometimes required for non-standard specifications.

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Pin Definition



Notes:

- * No connection for PIN versions (not connected internally).
- † No connection for single-ended versions.

Pin #	Symbol	Function	Pin #	Symbol	Function
1	GND	Ground	8	GND	Ground
2	APD/PIN BIAS	Photodiode bias	9	GND	Ground
3	GND	Ground	10	DATA OUT	DATA
4	Vee	Vee (-5.2 V)	11	DATA OUT†	DATA†
5	GND	Ground	12	GND	Ground
6	Thermistor	Thermistor *	13	NC	No connection
7	GND	Ground	14	NC	No connection
			CASE	GND	Ground

Notes:

- * The thermistor is not available in the PIN version of the receiver. In 1319P-Type receivers, this pin will be open circuit internally.
- † This is an internal open circuit in single-ended output Receivers.

Application Notes

Mounting and Connections

The pigtail consists of a 41 in. ± 13 in. (1041 mm ± 330 mm), 8 μm core, single-mode fiber. The receive pigtails have a 1600 μm OD jacket diameter. Both models of the receiver are available with FC/PC or SC optical connectors. Other connector options may be available. Contact your Agiltron Sales Office for availability and ordering information.

The fiber bending radius during operation and storage is 1.5 in. (38 mm) minimum.

Electrostatic Discharge

CAUTION: Electrostatic discharge (ESD) will cause permanent damage to the product. Please avoid any ESD to the input pins or output connector. Use standard ESD protective equipment when handling this product.

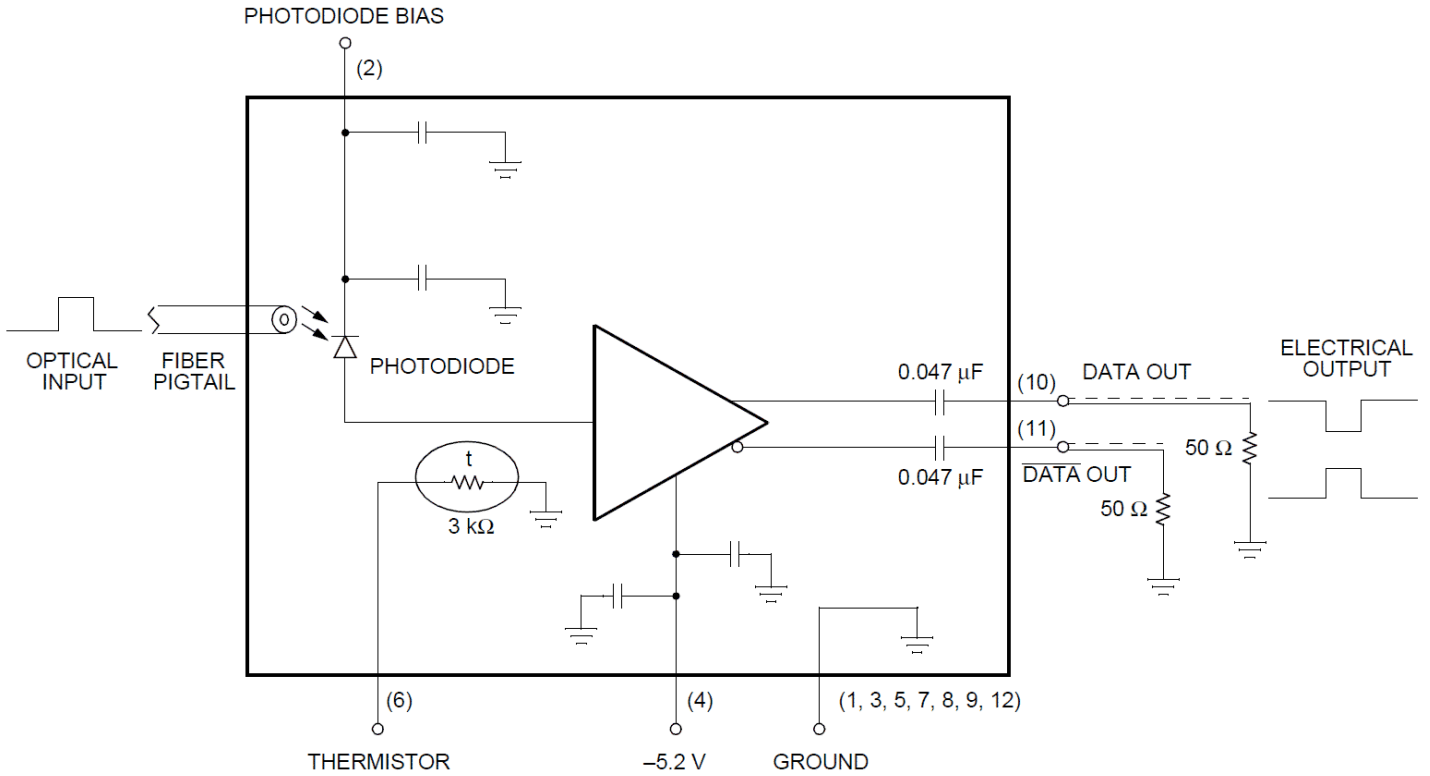
Although protection circuitry is designed into the device, take proper precautions to avoid exposure to ESD.

Lucent employs a human-body model (HBM) for ESD- susceptibility testing and protection design evaluation. ESD voltage thresholds are dependent on the critical parameters used to define the model. A standard HBM (resistance = 1.5 kΩ, capacitance = 100 pF) is widely used and, therefore, can be used for comparison purposes.

The HBM ESD withstand voltage established for the 1319-Type receiver is ±500 V.

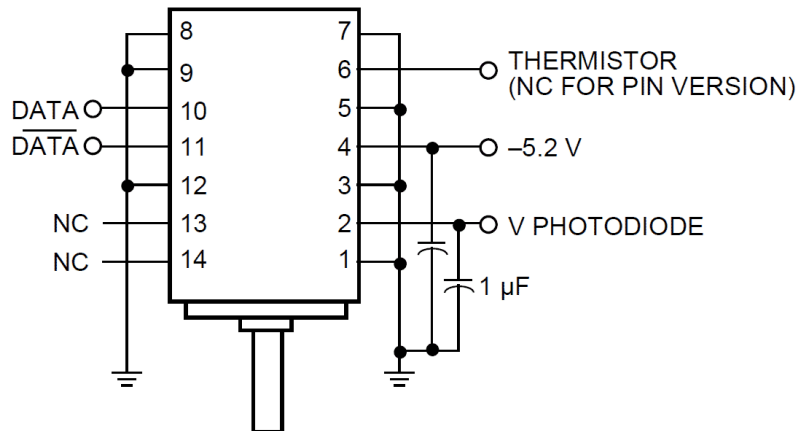
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High-Speed Lightwave Receiver Schematic



Note: The thermistor is not present on PIN version.

Recommended Circuit Diagram



Note: Pin 11 is a NC for single-ended output versions.

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Ordering Information

Prefix	Detector Type	Wavelength Range	Bandwidth	TEC	Module*	Configuration	Connector
FORX-	PIN = 1 APD = 2	1200-1600nm = 1	2GH = 02	Non = 1	Non = 1 Yes = 2	Standard = 11	FC/PC = 2 FC/APC = 3 Special = 0

* Module contains driver and power supply.

Laser Safety

This product meets the appropriate standard in Title 21 of the Code of Federal Regulations (CFR). FDA/CDRH Class 1M laser product. This device has been classified with the FDA/CDRH under accession number 0220191. All versions of this laser are Class 1M laser products, tested according to IEC 60825-1:2007 / EN 60825-1:2007. An additional warning for Class 1M laser products. For diverging beams, this warning shall state that viewing the laser output with certain optical instruments (for example eye loupes, magnifiers, and microscopes) within a distance of 100 mm may pose an eye hazard. For collimated beams, this warning shall state that viewing the laser output with certain instruments designed for use at a distance (for example telescopes and binoculars) may pose an eye hazard.

Wavelength = 1.3/1.5 μm .

Maximum power = 30 mW.

