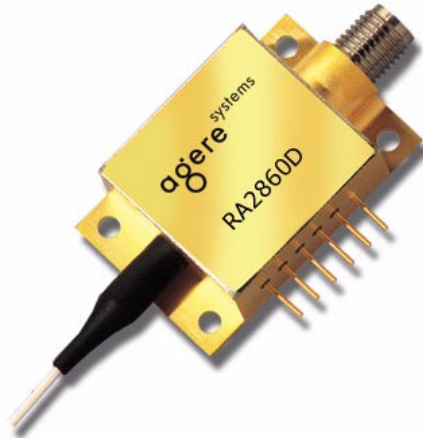


## RA2860D 10 Gbits/s APD Receiver

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### Features

- 26 dB dynamic range
- Excellent sensitivity,  $-26$  dBm
- High overload, 0 dBm
- Transimpedance,  $500 \Omega$
- dc-coupled output
- Hermetically sealed optics

### Applications

- SONET/SDH equipment
- DWDM receivers
- Optical cross connects

### Description

The RA2860D 10 Gbits/s receiver module incorporates a high-gain bandwidth APD and a preamplifier to provide exceptional dynamic range, including very high sensitivity and excellent overload.

Agere Systems Inc. offers several 1R and 2R high-speed receiver components for 10 Gbits/s and 12.5 Gbits/s applications. APD and PIN versions are available in a 6-pin hermetic package with coaxial output. In addition, Agere Systems also offers a PIN receiver with coplanar waveguide in a multisource agreement form-factor or a smaller, space-sensitive package. For more information about the complete line of high-speed receiver products, please visit the Agere Systems' website at [www.agere.com/opto](http://www.agere.com/opto).

## Absolute Maximum Ratings

Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. These are absolute stress ratings only. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of the data sheet. Exposure to absolute maximum ratings for extended periods can adversely affect device reliability.

Parameter	Symbol	Min	Max	Unit
Operating Temperature Range	T <sub>OP</sub>	-5	70	°C
Storage Case Temperature Range	T <sub>stg</sub>	-40	85	°C
Preamplifier Supply Voltage	V <sub>CC</sub>	0	8.5	V
Avalanche Photodiode Bias Voltage*	V <sub>PD</sub>	0	50	V
Avalanche Photodiode Bias Current*	I <sub>PD</sub>	0	3	mA
Optical Input Power	—	—	1	dBm

\* At high optical power; current must be limited.

## Electrical/Optical Characteristics

**Table 1. Electrical and Optical Characteristics** (25 °C case temperature. Test conditions: 10 Gbits/s, NRZ, ER ≥ 10 dB, T<sub>A</sub> = 25 °C)

Parameter	Symbol	Min	Typ	Max	Unit
Sensitivity (10 <sup>-12</sup> BER, PRBS 2 <sup>23</sup> - 1), M = 9, λ = 1550 nm	—	—	-26	-24.5	dBm
Overload (10 <sup>-12</sup> BER, PRBS 2 <sup>23</sup> - 1), M = 3, λ = 1550 nm	—	-3	0	—	dBm
Responsivity, M = 1, λ = 1550 nm	R	0.64	0.68	—	A/W
High-frequency Cutoff, 3 < M < 9	—	7.0	—	—	GHz
Low-frequency Cutoff	—	—	—	30	kHz
Transimpedance	Z	400	500	600	Ω
RF Output Return Loss* (0.1 GHz—8 GHz)	RL <sub>RF</sub>	—	—	9	dB
Optical Return Loss	RL	27	—	—	dB
Output dc Voltage*	—	—	3.0	—	V
Dark Current	I <sub>D</sub>	—	—	TBD	nA
Logic Sense	—	—	Noninverting	—	—
Preamplifier Supply Voltage	V <sub>CC</sub>	7.6	8.0	8.4	V
Supply Current	I <sub>CC</sub>	—	110	130	mA
APD Supply Voltage: 25 °C, M = 9 -5 °C to +70 °C	V <sub>PD</sub>	20 20	40 —	45 50	V V
Thermistor	R <sub>TH</sub>	9.5	—	10.5	kΩ
Thermistor Coefficient	—	—	-4.4	—	%/°C

\* External dc block required on RF output.

Characteristic Curves at 10 Gbits/s,  $2^{23} - 1$  PRBS

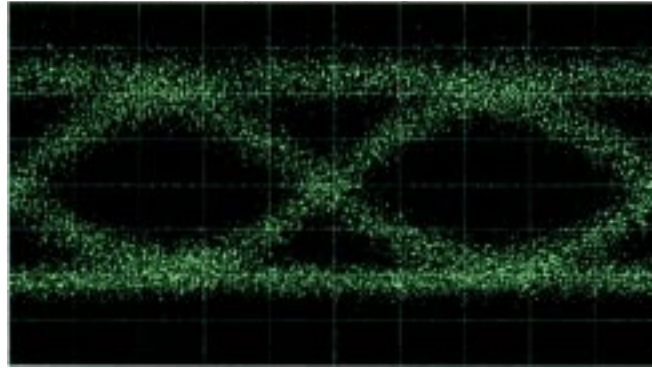


Figure 1. Eye Pattern: PIN at -25 dBm, M = 9, 0 km, 5 mV/div, 20 ps/div 1-1278F

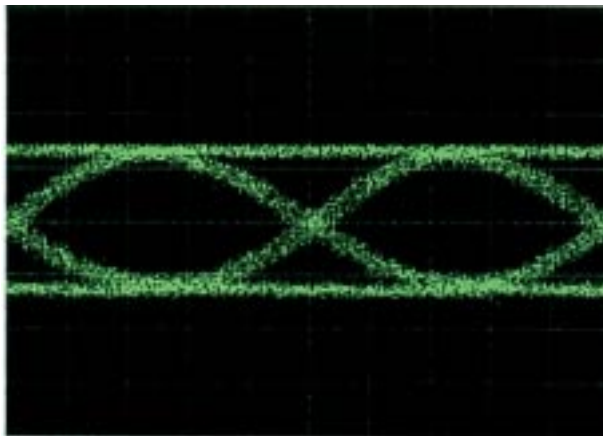


Figure 2. Eye Pattern: PIN at -12 dBm, M ~ 9, 0 km, 50 mV/div, 20 ps/div 1-1276F

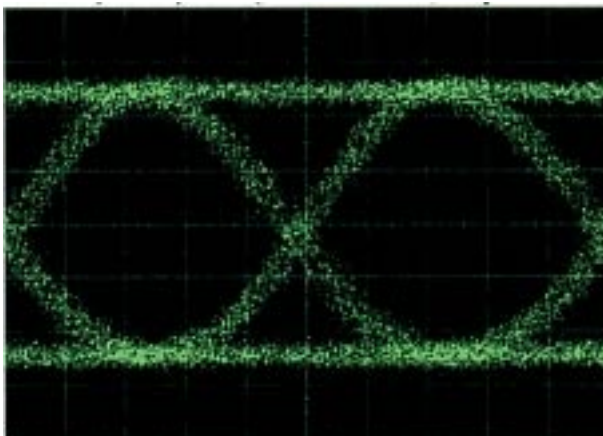


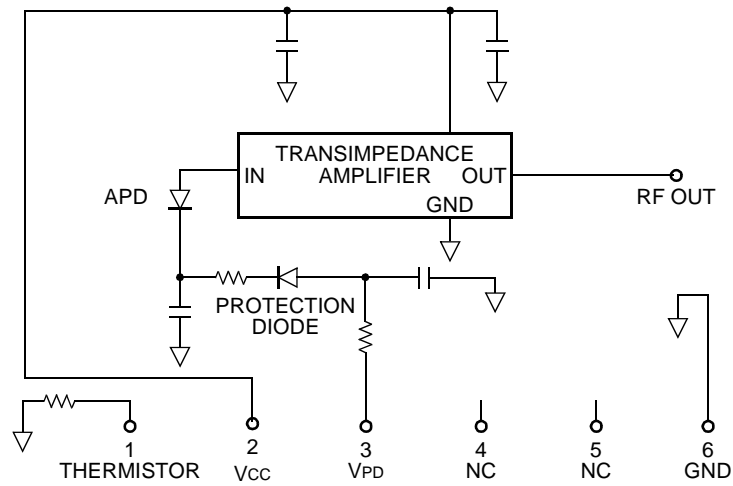
Figure 3. Eye Pattern: PIN at -3 dBm, M = 3, 0 km, 100 mV/div, 20 ps/div 1-1277F

**Pin Information**

**Table 2. Pin Descriptions**

Pin No.	Description
1	Thermistor
2	TIA (Vcc)
3	Photodiode (VPD)
4	NC
5	NC
6	Ground

**Block Diagram**

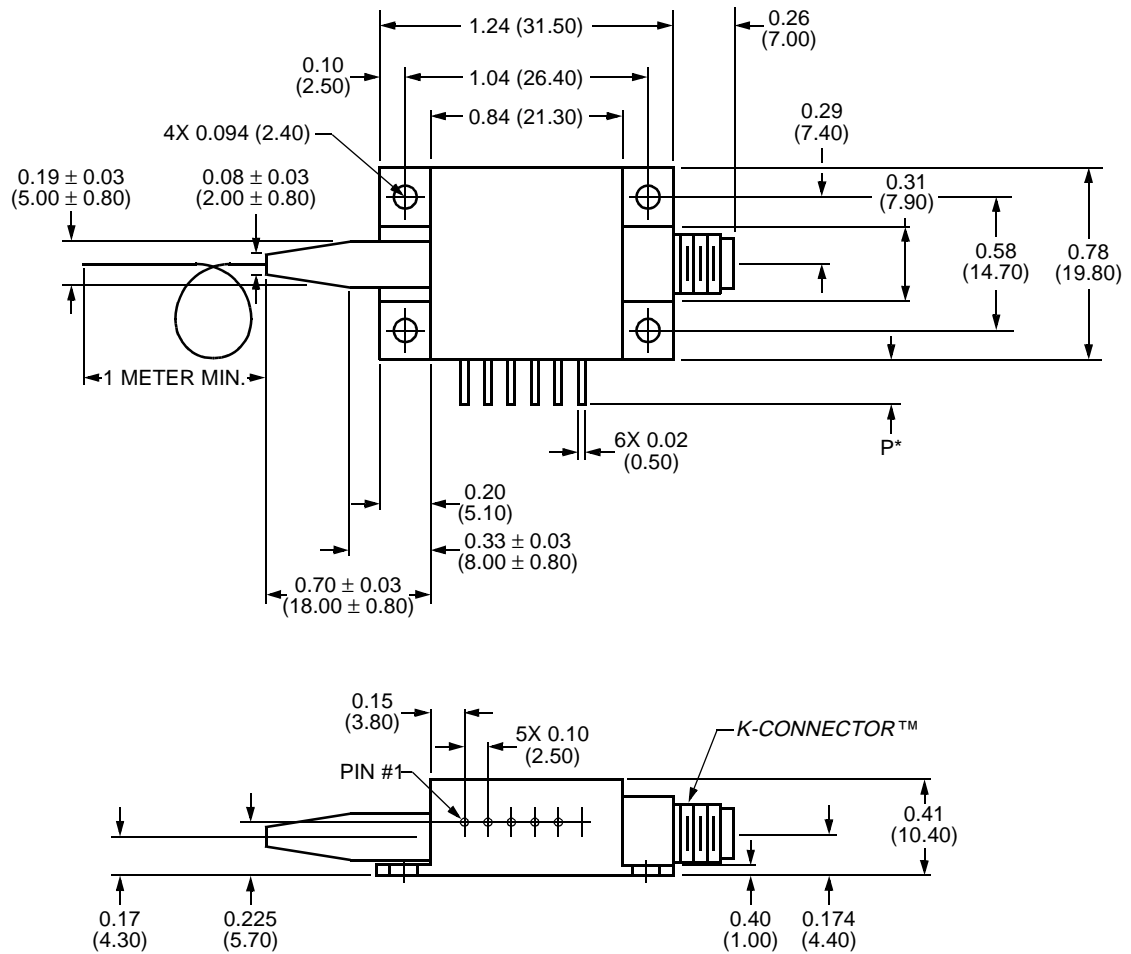


1-1173(F).a

## Outline Diagram

Dimensions are in inches and (millimeters).

Mechanical tolerances, unless otherwise specified, are: 0.XX =  $\pm 0.01$  ( $\pm 0.25$ ), 0.XXX =  $\pm 0.007$  ( $\pm 0.18$ ).



\*P = pin length.

Note: External dc block required on RF output.

1-1169Fb

## Ordering Information

For ordering information, please contact an account manager at Opto West, Agere Systems Inc., 1-800-362-3891 (for sales staff, please press option 2).

*K-Connector* is a trademark of Anritsu Company.

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For additional information, contact your Agere Systems Account Manager or the following:

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