

## FEATURES

- 10 Gb/s differential output TIA
- 8.5 GHz Bandwidth
- -19 dBm Typical Sensitivity
- +3 dBm Optical Overload
- 1250-1620nm PIN Photodetector
- Transimpedance gain of 10K and 600mVpp output

## APPLICATIONS

- SONET OC-192/SDH STM-64
- 10Gb/s Ethernet



High speed 5-pin package

## Product Description

The ANADIGICS AMT8650 is a low cost optical receiver capable of operation to 10Gb/s. A high performance PIN photodiode and a low noise, high gain transimpedance pre-amplifier (TIA) are incorporated in a hermetic, high speed header. The bandwidth is 8.5Ghz and dynamic range is over 22dB.

High gain of the TIA eliminates the need for a separate post amplifier in most applications. These devices are readily designed into receivers, transceivers and transponders for SONET OC-192/SDH STM-64 and 10 Gigabit Ethernet.

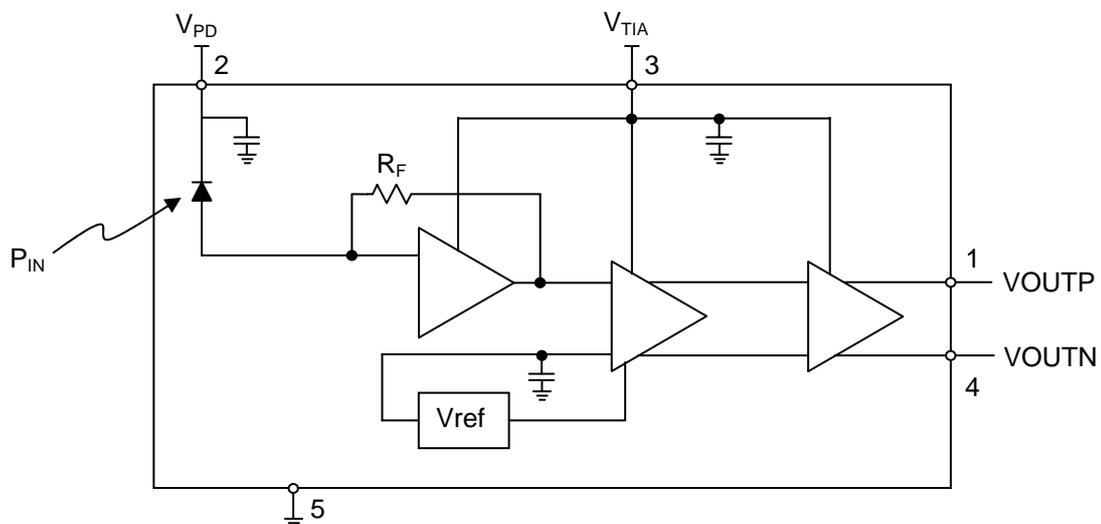


Figure 1: Functional Block Diagram

# AMT8650



## ELECTRICAL CHARACTERISTICS

**Table 1: Absolute Maximum Ratings**

PARAMETER	MIN	MAX	UNIT
Supply Voltage	-0.5	5.5	V
Photodiode bias Voltage	2.5	10	V
Optical Input Power	-	+ 4	dBm
Storage Temperature	- 40	+ 85	°C

Stresses in excess of the absolute ratings may cause permanent damage. Functional operation is not implied under these conditions. Exposure to absolute ratings for extended periods of time may adversely affect reliability.

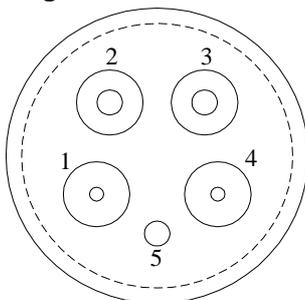
**Table 2: Electrical Specifications**

PARAMETER	MIN	TYP	MAX	UNIT
Wavelength	1250	-	1620	nm
Sensitivity <sup>(1)</sup>	-	-19	-	dB
Overload	-	3	-	dBm
Responsivity 1550nm	0.80	0.90	-	A/W
Responsivity 1310nm	0.75	0.85	-	A/W
Dark current	-	0.2	5	nA
Small signal transimpedance gain (differential)	-	10	-	KΩ
Small signal 3dB bandwidth	-	8.5	-	GHz
Low frequency cutoff	-	30	-	KHz
Output return loss (differential) <sup>(2)</sup>	-	9	-	dB
Output voltage swing (differential)	-	600	-	mV <sub>P-P</sub>
Optical return loss	50	55	-	dB
Photodiode bias voltage	4	5	9	V
TIA supply voltage	4.7	5	5.3	V
TIA supply current	-	48	-	mA
Power consumption	-	240	-	mW
Operating temperature	-40	25	85	°C

(1) 10Gb/s PRBS 2<sup>31</sup>-, 1550nm, ER >12dB

(2)  $\frac{1}{2}(S_{11} - S_{21} + S_{22} - S_{12})$ , 100MHz – 9GHz

**Figure 2: Pin location**



**Table 3: Pin description**

PIN	NAME	DESCRIPTION
1	VOUTP	Non-inverted output voltage. Logical '1' with an optical input. Output is not AC coupled.
2	V <sub>PD</sub>	Photodiode bias: 5V
3	V <sub>TIA</sub>	Amplifier supply voltage: 5V
4	VOUTN	Inverted output voltage: Logical '0' with an optical input. Output is not AC coupled
5	Ground	Ground

## PERFORMANCE



Figure 3: Frequency response of AMT8650-T46L-EVA (-20dBm optical input)

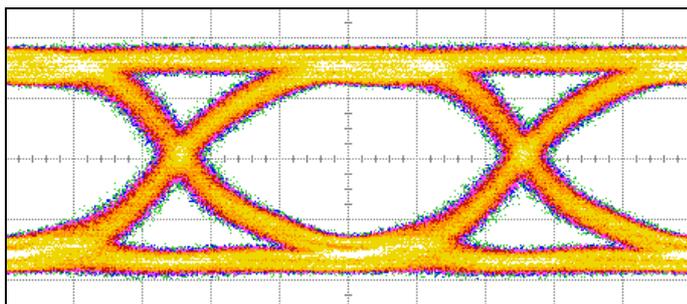


Figure 4: Optical input power: -5dBm, extinction ratio: 12dB. (100mV/Div, 20ps/Div)

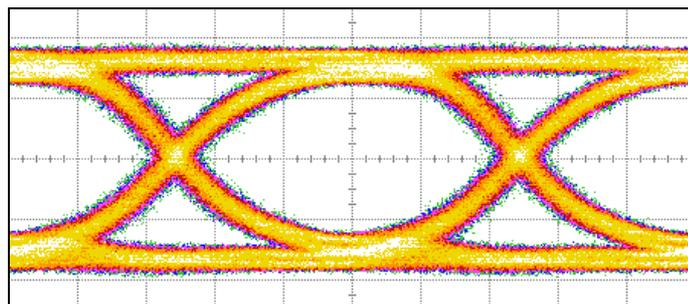


Figure 5: Optical input power: -10dBm, extinction ratio: 12dB. (100mV/Div, 20ps/Div)

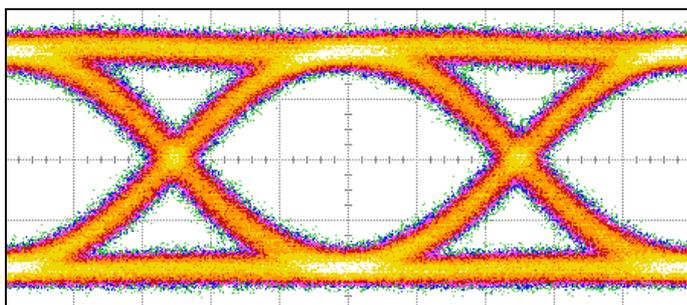


Figure 6: Optical input power: -15dBm, extinction ratio: 12dB. (50mV/Div, 20ps/Div)

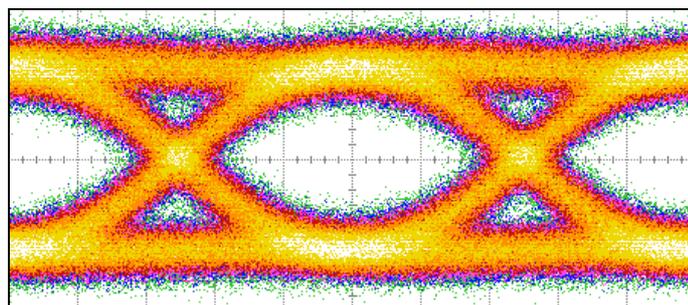
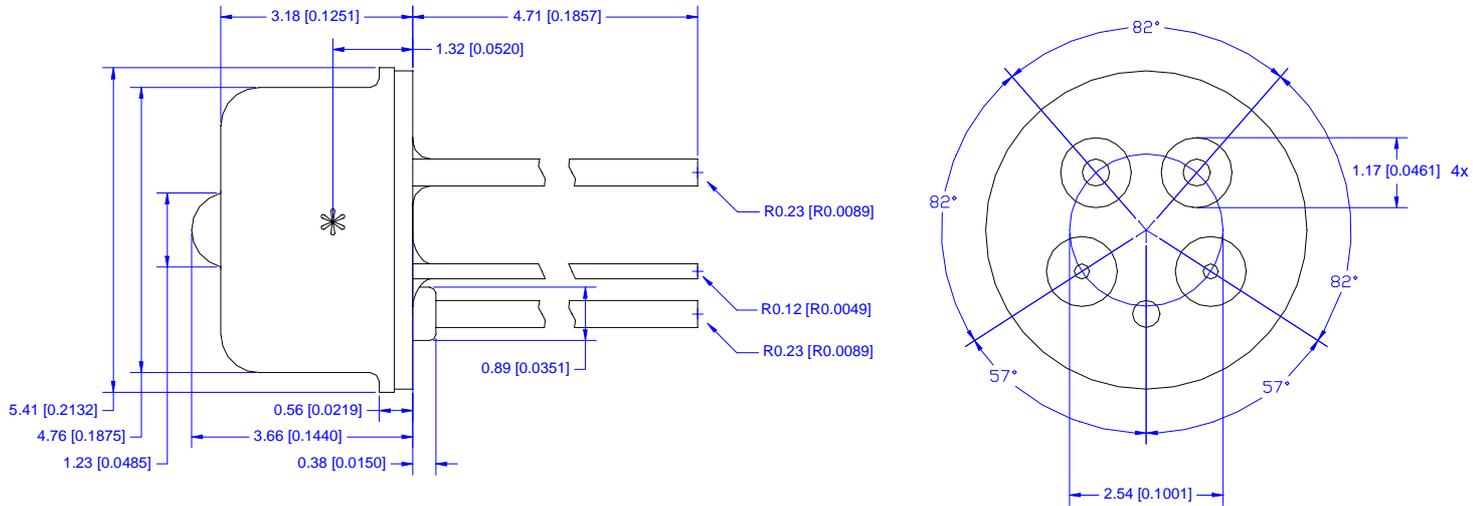


Figure 7: Optical input power: -20dBm, extinction ratio: 12dB. (20mV/Div, 20ps/Div)

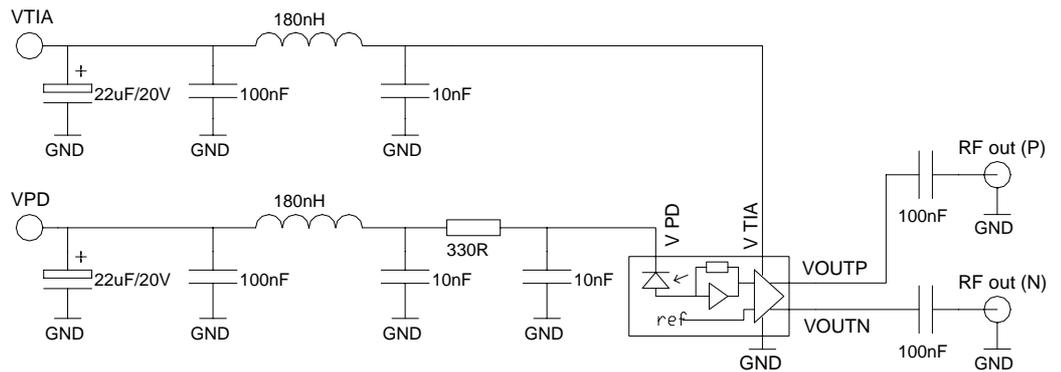
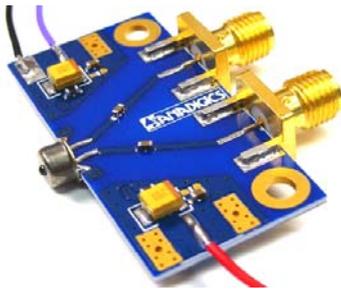
# AMT8650



## PACKAGE DIMENSIONS (mm [Inches])



## EVALUATION BOARD



## ORDERING INFORMATION

Part Number	PACKAGE DESCRIPTION
AMT8650-T46L	5V High speed 5 pin package with ball lens
AMT8650-H1	5V High speed 5 pin package with SC/APC pigtail
AMT8650-T46L-EVA	5V High speed 5 pin package with ball lens mounted on evaluation board
AMT8650-H1-EVA	5V High speed 5 pin package with pigtail mounted on evaluation board

### ANADIGICS, Inc.

829 Flynn Road  
 Camarillo, California 93012, U.S.A.  
 Tel: +1 (805) 445-4500  
 Fax: +1 (805) 445-4502  
 URL: <http://www.anadigics.com>  
 E-mail: [Mktg@anadigics.com](mailto:Mktg@anadigics.com)

#### IMPORTANT NOTICE

ANADIGICS, Inc. reserves the right to make changes to its products or discontinue any product at any time without notice. The product specifications contained in Advanced Product Information sheets and Preliminary Data sheets are subject to change prior to a product's formal introduction. Information in Data Sheets have been carefully checked and are assumed to be reliable; however, ANADIGICS assumes no responsibility for inaccuracies. ANADIGICS strongly urges customers to verify that the information they are using is current before placing orders.

#### WARNING

ANADIGICS products are not intended for use in life support appliances, devices, or systems. Use of an ANADIGICS product in any such application without written consent is prohibited.