AMT8410

2.5 Gb/s 1310/1550nm PIN-TIA

PRELIMINARY DATA SHEET - Rev 1.1

FEATURES

- 2.5 Gb/s Differential Output TIA
- 3.3 V Operation
- Automatic Gain Control
- 55 µm 1270-1560 nm PIN Photodetector
- 2000 MHz Bandwidth
- -23 dBm Typical Sensitivity
- +2 dBm Optical Overload
- TO-46 Lens Package

APPLICATIONS

- SONET OC-48/SDH STM-16 (2.488 Gb/s)
- 2 x Fibre Channel (2.125 Gb/s)
- 2.5 Gb/s Infiniband



TO-46L
TO-46 Ball Lens Package

PRODUCT DESCRIPTION

The ANADIGICS AMT8410, packaged in a TO46 lens can, is a 3.3 V integrated photodetector and transimpedance amplifier (TIA) used to convert a long wavelength (1270 to 1560 nm) input optical signal into a differential output voltage. The AMT8410 has a bandwidth of 2000 MHz and a dynamic range of 25 dB. These devices are readily designed into receivers, transceivers and transponders for SONET, Fibre Channel and Infiniband applications.

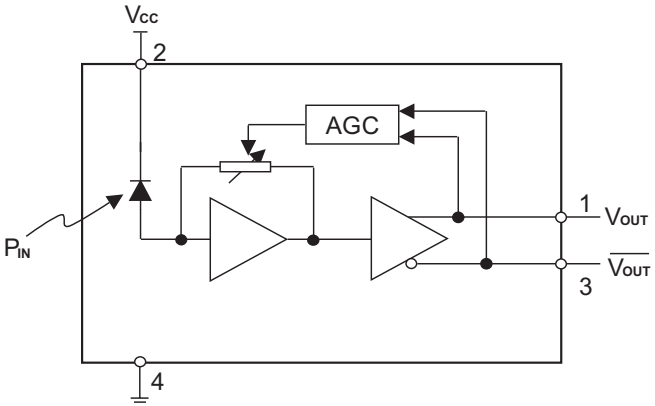


Figure 1: Funtional Block Diagram

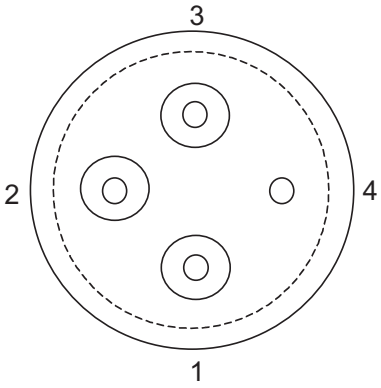


Figure 2: T46L Pinout (Bottom View)

Table 1: Pin Description

PIN	DESCRIPTION	COMMENT
1	V_{OUT} - TIA Output Voltage (Non-Inverted)	Logical '1' with optical input
2	V_{CC} - Positive Supply Voltage	+3.3 Volts
3	$\overline{V_{OUT}}$ - TIA Output Voltage (Inverted)	Logical '0' with optical input
4	Ground	Case is grounded

ELECTRICAL CHARACTERISTICS

Table 2: Absolute Maximum Ratings

V_{CC}	6.0 V
P_{IN}	+4 dBm
T_S	Storage Temp. -65 °C to 125 °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 3: Electrical Specifications

PARAMETER	MIN	TYP	MAX	UNIT
Wavelength (λ)	1270	1300	1560	nm
Detector Active Area	-	55	-	μm
Small Signal Differential Responsivity (@ 100 MHz) (1)	1700	2000	-	V/W
Bandwidth (1)	1700	2000	-	MHz
Low Frequency Cutoff	-	100	-	kHz
Output Resistance	-	50	-	Ω
Optical Overload (2)	0	+2	-	dBm
Optical Sensitivity (2)	-21	-23	-	dBm
Maximum Differential Output Voltage	-	-	300	mV
T_{RISE} & T_{FALL} (20 - 80%) (3)	-	160	-	ps
Duty Cycle Distortion (4)	-	6	-	%
Total Jitter (4), (5)	-	45	-	ps
Supply Current	-	55	100	mA
Operating Voltage Range	+3.0	+3.3	+3.6	V
Operating Temperature Range	-40	-	+85	°C

Notes:

(1) Measured at -17 dBm optical input power with output connected into R_L = 100 Ω (differential).

(2) Measured at 10^{-10} BER with a 2^{23}-1 PRBS at 2.5 Gb/s.

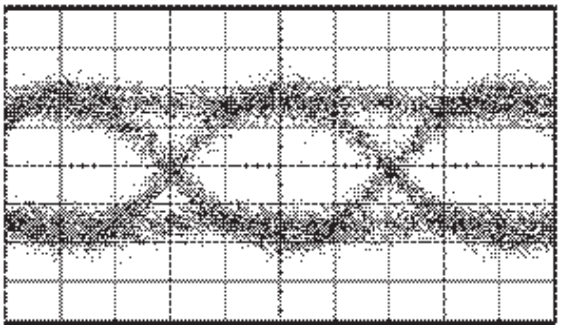
(3) Measured with a 2^{23}-1 PRBS at 2.5Gb/s, an input optical power of -17dBm and R_L = 100 Ω (differential).

(4) Measured with a 2^{23}-1 PRBS at 2.5Gb/s, an input optical power of -3dBm and R_L = 100 Ω (differential).

(5) 6σ about the center eye crossing.

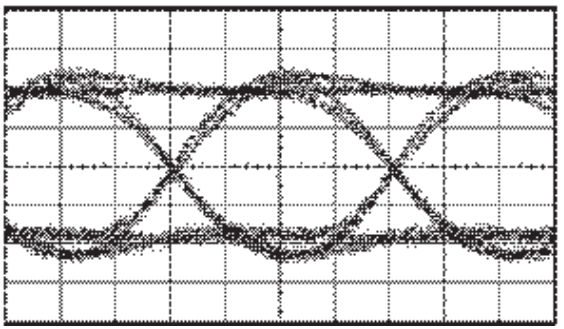
PERFORMANCE DATA

Figure 3: Eye Diagram with an Optical Input Power of -23 dBm



100 ps/Div. 5 mV/Div.

Figure 4: Eye Diagram with an Optical Input Power of -15 dBm



100 ps/Div. 25 mV/Div.

Figure 5: Supply Current vs. Case Temperature

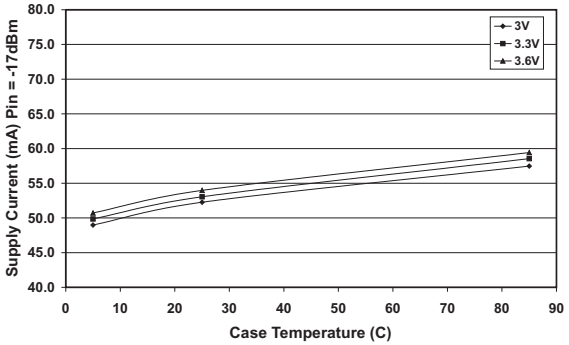


Figure 6: Bandwidth vs. Case Temperature

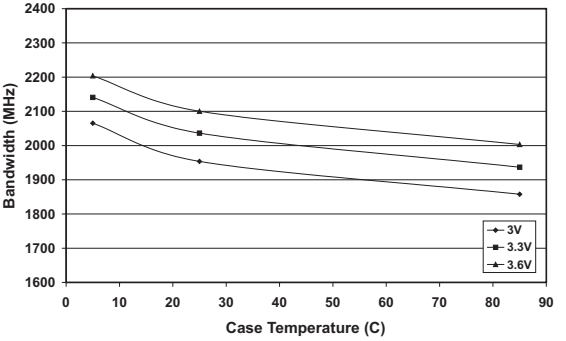


Figure 7: Differential Responsivity vs. Case Temperature

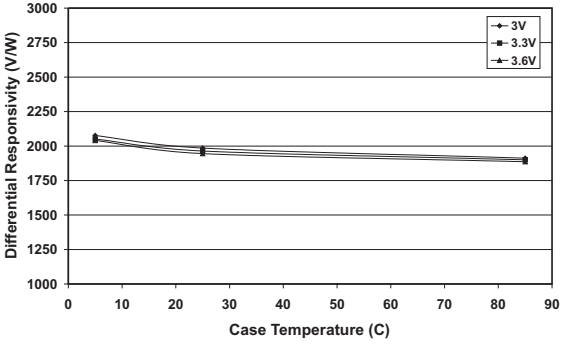
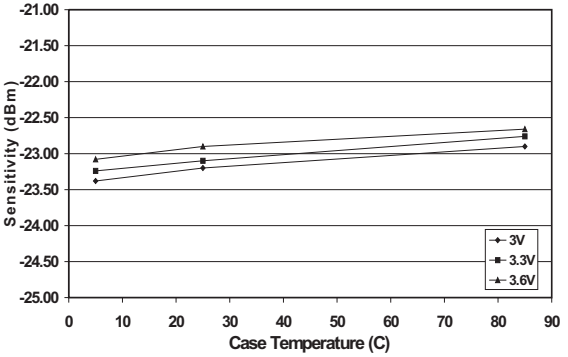


Figure 8: Sensitivity vs. Case Temperature



MEASUREMENT METHODS

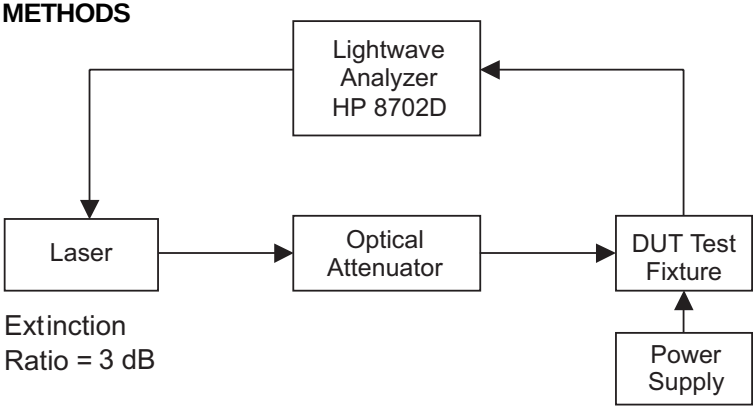


Figure 9: Test Setup for Frequency Measurements

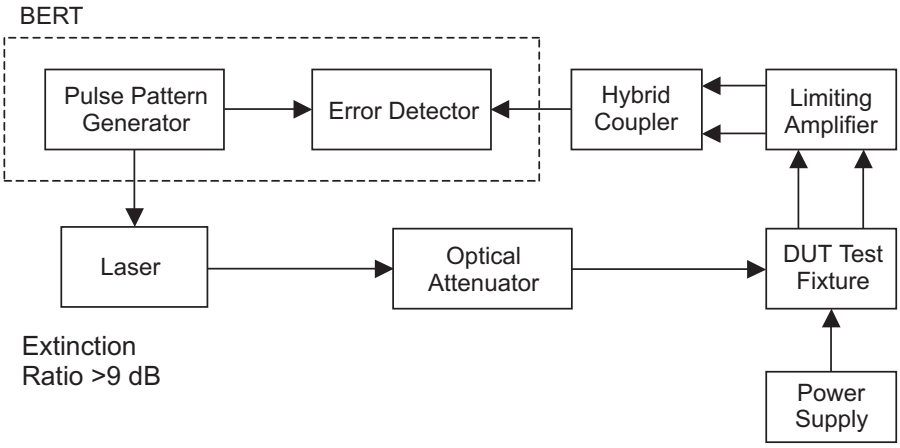


Figure 10: Test Setup for Sensitivity Measurements

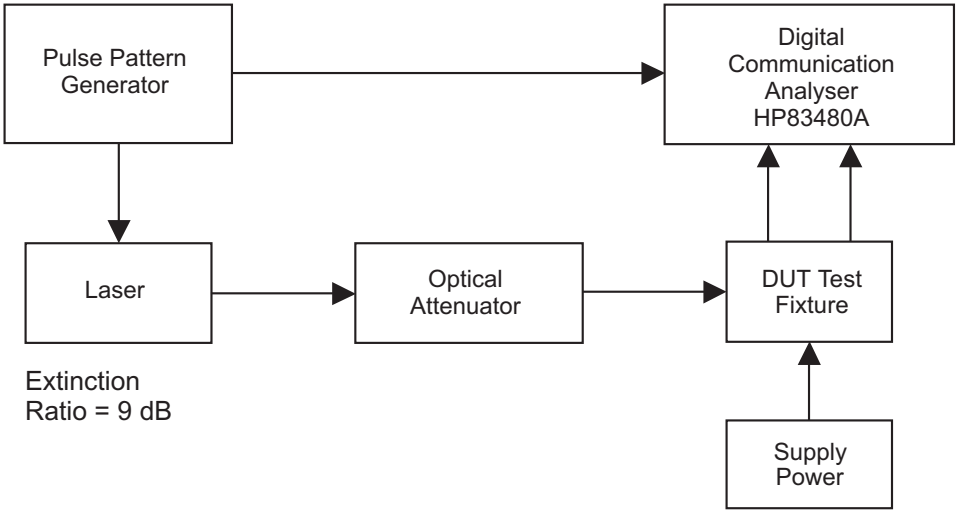


Figure 11: Test Setup for Eye Measurements

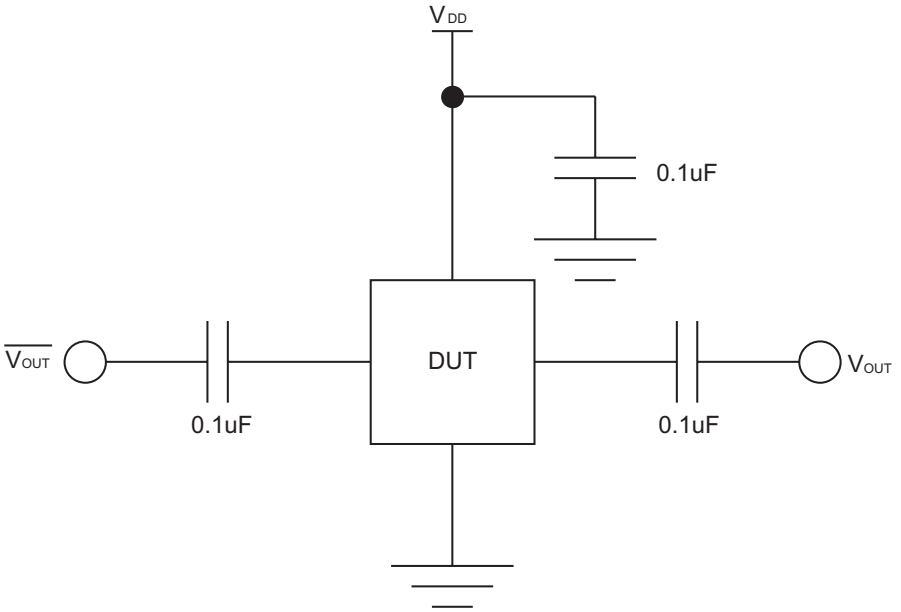
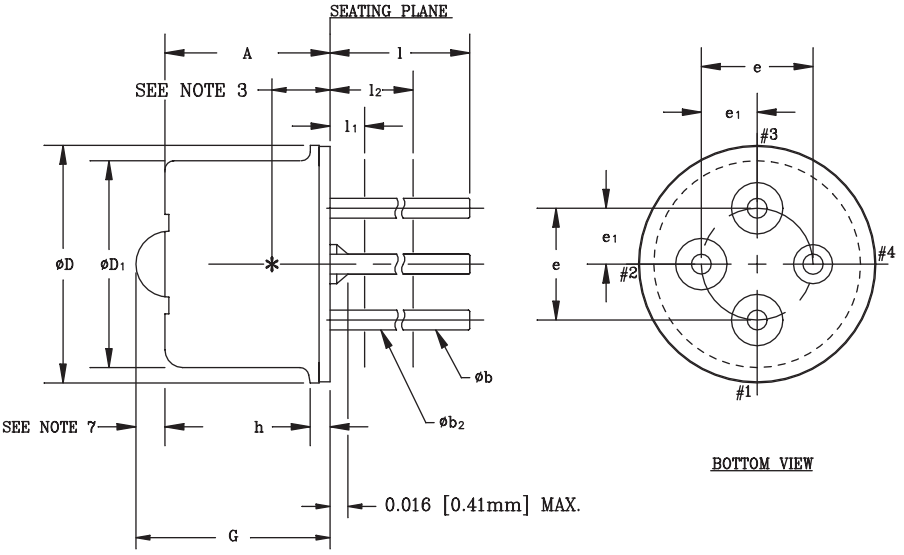


Figure 12: DUT Test Fixture Schematic

PACKAGE OUTLINE



MM CONTROLLING DIMENSIONS

SYMBOL	INCHES		MILLIMETERS		NOTE
	MIN.	MAX.	MIN.	MAX.	
A	--	0.160	--	4.00	
øb	0.016	0.020	0.41	0.51	1
øb2	0.012	0.019	0.30	0.48	1
øD	0.212	0.218	5.38	5.54	
øD1	0.181	0.187	4.60	4.75	
e	0.100 T.P.		2.54 T.P.		2
e1	0.050 T.P.		1.27 T.P.		2
h	0.014	0.022	0.36	0.56	
l	0.500	0.540	12.70	13.70	1
l1	–	0.050	–	1.27	1
l2	0.250	–	6.35	–	1
G	--	0.190	--	4.66	7

NOTES:

1. (FOUR LEADS) øb2 APPLIES BETWEEN l1 AND l2 . øb APPLIES BETWEEN l2 AND 0.5 [12.70mm] FROM SEATING PLANE. DIAMETER IS UNCONTROLLED IN l1 AND BEYOND 0.5 [12.70mm] TO END OF PIN.
2. MAXIMUM DIAMETER LEADS AT A GAGING PLANE 0.054 [1.37mm]+0.001 [0.025mm] −0.000 [0.000mm] BELOW SEATING PLANE TO BE WITHIN 0.007 [0.178mm] OF THEIR TRUE POSITION RELATIVE TO MAXIMUM−WIDTH TAB AND TO THE MAXIMUM 0.212 [5.40mm] DIAMETER MEASURED WITH A SUITABLE GAGE. WHEN GAGE IS NOT USED, MEASUREMENT WILL BE MADE AT 0.250 [6.35mm] FROM SEATING PLANE.
3. INTERNAL OPTICAL HEIGHT = 0.065±0.005[1.65±0.1]
4. BENT LEADS SHOULD NOT EXTNED OUTSIDE DIAMETER (øD) OF CAP OR TOUCH EACH OTHER.
5. ALL DIMENSIONS ARE REFENENCE ONLY−EXCEPT A, D & h.
6. DETECTOR DIODE PLACEMENT ACCURACY: ⌖ 0.15MM[0.006] WITH RESPECT TO CENTER OF HEADER: REFERENCE ONLY
7. LENS HEIGHT = 0.65±0.1 [0.026±0.004]

Figure 13: T46L Package Outline Diagram

ORDERING INFORMATION

ORDER NUMBER	TEMPERATURE RANGE	PACKAGE DESCRIPTION	COMPONENT PACKAGING
AMT8410T46L	-40 °C to +85 °C	TO-46L Ball Lens Package	-

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