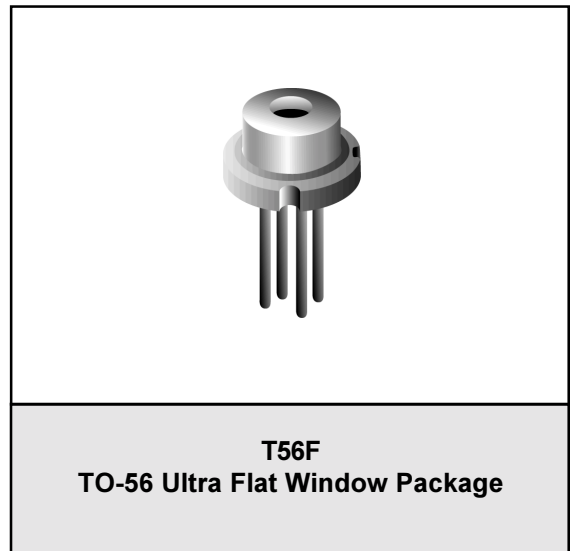


### FEATURES

- Differential Output TIA
- 3.3V Operation
- Automatic Gain Control
- Integrated 850nm MSM Detector & TIA
- TO-56 Ultra Flat-Window Hermetic Package
- High Reliability

### APPLICATIONS

- 2x Fibre Channel (2.125 Gb/s)

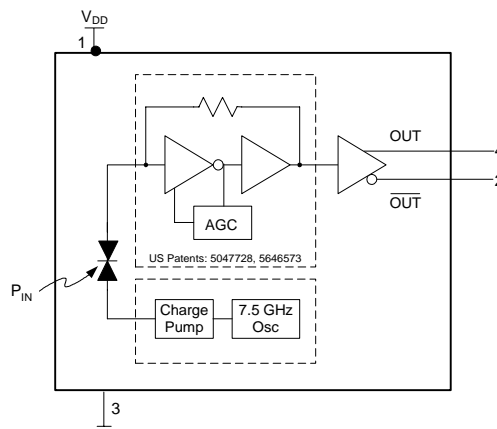


### Product Description

The ANADIGICS AMT8302 is a 3.3V monolithically integrated Metal-Semiconductor-Metal (MSM) photodetector and transimpedance amplifier (TIA) used to convert an 850nm input optical signal into a differential output voltage, and is manufactured in ANADIGICS' 6" GaAs wafer fabrication facility. The integrated MSM and TIA receiver maximizes the receiver performance by minimizing the photodetector input parasitics to the TIA and

internally biasing the photodetector to achieve high sensitivity, bandwidth and overload performance. As an integrated product the reliability is inherently better than a discrete solution, and both the MSM-TIA integrated circuit and TO56 flat window packaged receiver pass stringent reliability requirements. These products are readily designed into receivers and transceivers for 2X Fibre Channel applications.

**Figure 1: AMT8302 Equivalent Circuit**



**Table 1: Absolute Maximum Ratings**

$V_{DD}$	6.0V
$P_{IN}$	+5dBm
$T_S$	Storage Temp. - 65 °C to 125 °C

**Table 2: Electrical Characteristics**

PARAMETER	MIN	TYP	MAX	UNIT
Wavelength ( $\lambda$ )	770	850	860	nm
Detector Diameter	-	100	-	$\mu$ m
Small Signal Differential Responsivity <sup>(1)</sup> (@ 50 MHz)	1000	-	-	V/W
Bandwidth <sup>(1)</sup>	1400	1900	-	MHz
Low Frequency Cutoff	-	-	300	kHz
Output Resistance	-	40	-	$\Omega$
Optical Overload <sup>(2)</sup>	0	-	-	dBm
Optical Sensitivity <sup>(2)</sup>	-19	-	-	dBm
Differential Output Voltage <sup>(3)</sup>	-	750	-	mV
$T_{RISE}$ and $T_{FALL}$ (20-80%) <sup>(3)</sup>	-	140	-	ps
Duty Cycle Distortion <sup>(3)</sup>	-	5	-	%
Total Jitter <sup>(3), (4)</sup>	-	50	-	ps
Supply Current	-	35	55	mA
Operating Voltage Range	+ 3.0	+3.3	+3.6	Volts
Operating Case Temperature Range	0	-	80	°C

(1) Measured at -14 dBm optical input power with output connected into  $R_L = 100\Omega$  (differential)

(2) Measured at  $10^{-10}$  BER with a  $2^7-1$  PRBS at 2.125 Gb/s

(3) Measured with a  $2^7-1$  PRBS at 2.125 Gb/s, an input optical power of -3dBm and  $R_L = 100 \Omega$  (differential)

(4)  $6\sigma$  about the center eye crossing

**Table 3: Package PIN Description**

Pin	Description	Comment
1	$V_{DD}$ - Positive Supply Voltage	+3.3 Volts
2	$\overline{V}_{OUT}$ - TIA Output Voltage (Inverted)	Logical '0' with optical input
3	Ground	Case is grounded
4	$V_{OUT}$ - TIA Output Voltage (Non-Inverted)	Logical '1' with optical input

Figure 2: Eye Diagram with an Optical Input Power of -18dBm

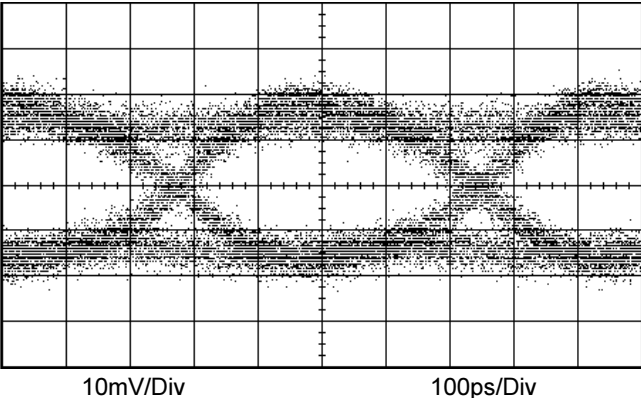


Figure 3: Eye Diagram with an Optical Input Power of -8.0dBm

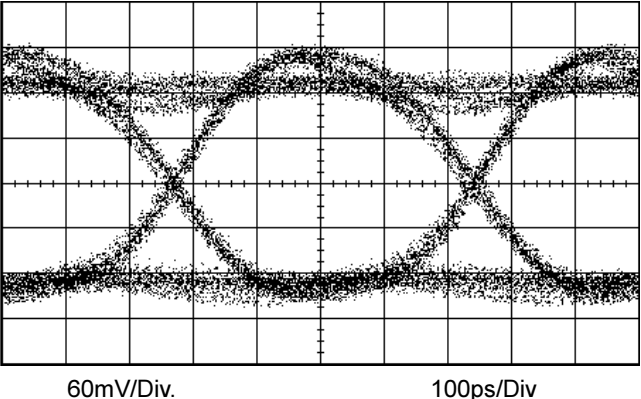


Figure 4: Eye Diagram with an Optical Input Power of 0dBm

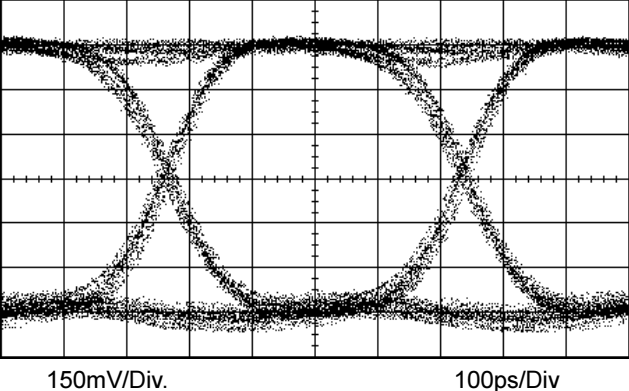


Figure 5: Supply Current vs. Temperature

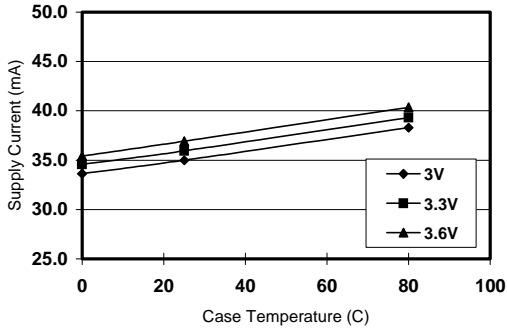


Figure 6: Bandwidth vs. Temperature

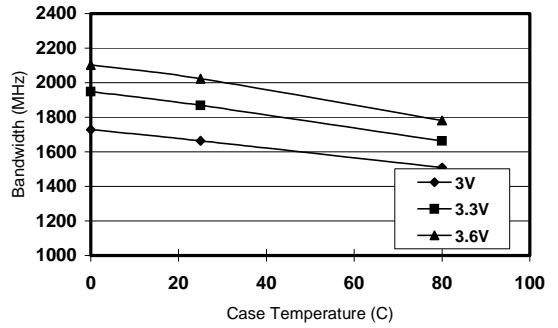


Figure 7: Differential Responsivity vs. Temperature

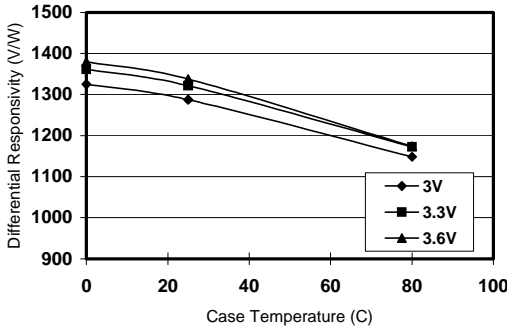


Figure 8: Sensitivity vs. Temperature

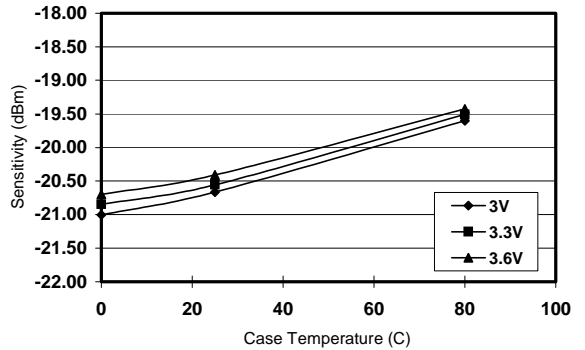


Figure 9: Test Setup for Frequency Response

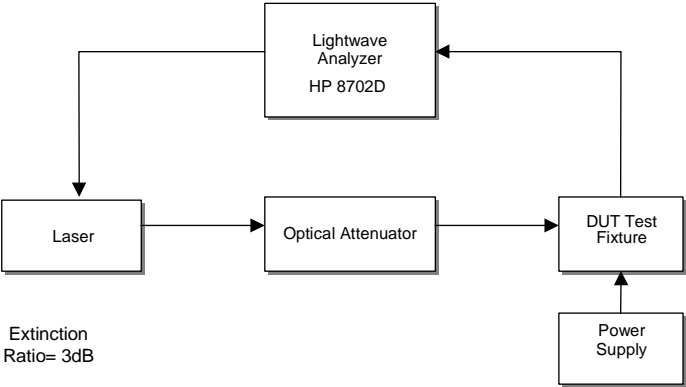


Figure 10: Test Setup for Sensitivity

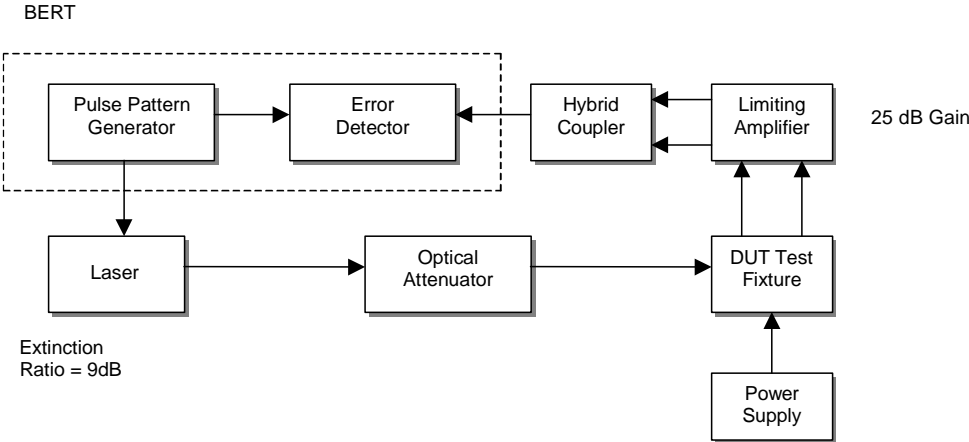


Figure 11: Test Setup for Eye Measurements

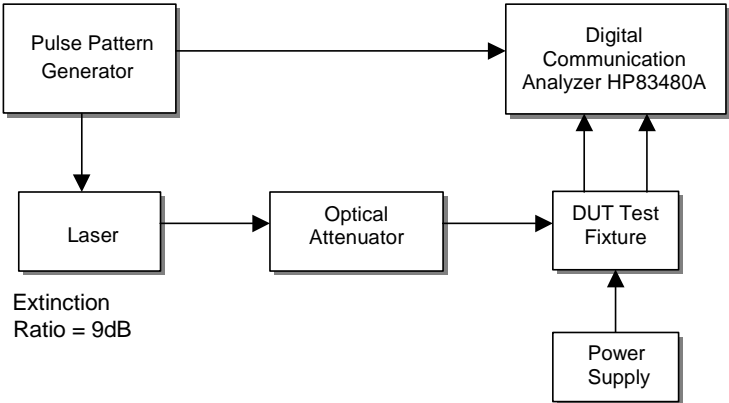


Figure 12: DUT Test Fixture Schematic

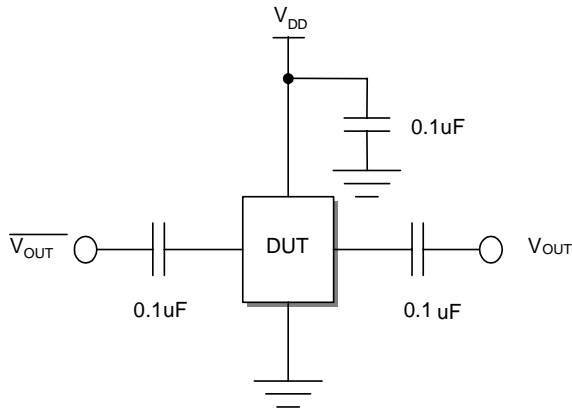
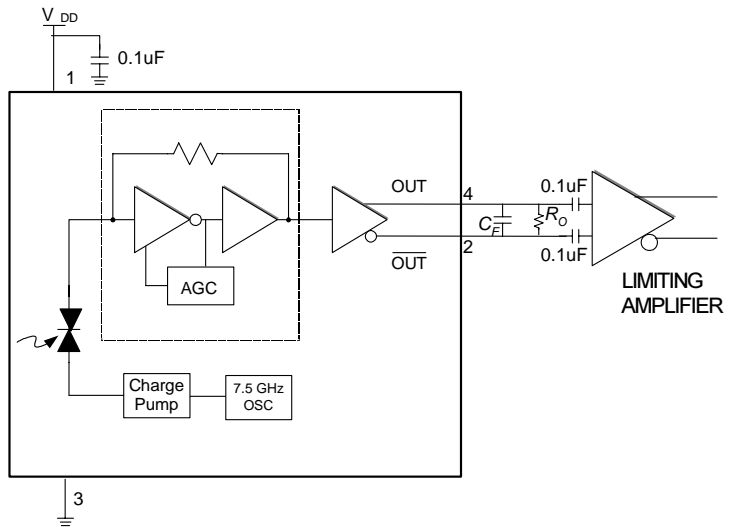


Figure 13: Application Schematic



$C_F$  is an optional single pole noise filter

$$C_F = \frac{1}{2\pi f_c R}$$

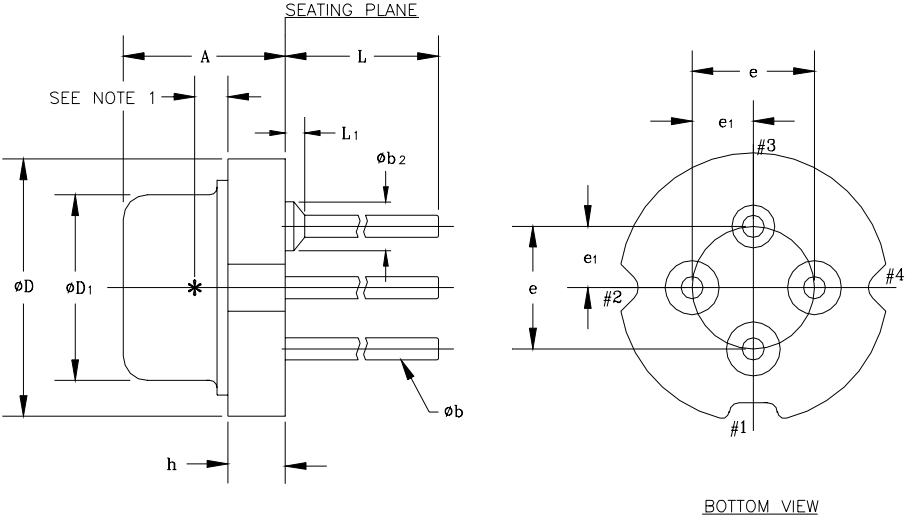
$f_c$  is the desired cutoff frequency

$$R = 50 \Omega$$

$R_O$  is required with high input resistance limiting amplifiers

$$R_O = 100 \Omega$$

Figure14: T56F Package Outline Design



MM CONTROLLING DIMENSIONS

S <sub>V</sub> M <sub>BOL</sub>	MILLIMETERS		INCHES		NOTE
	MIN.	MAX.	MIN.	MAX.	
A	3.10	3.50	0.122	0.138	
φb	0.41	0.48	0.016	0.019	
φb <sub>2</sub>	—	0.89	—	0.035	
φD	5.57	5.60	0.219	0.221	
φD <sub>1</sub>	3.80	3.90	0.150	0.154	
e	2.54 T.P.		0.100 T.P.		
e <sub>1</sub>	1.27 T.P.		0.050 T.P.		
h	1.10	1.30	0.043	0.051	
L	6.00	7.00	0.236	0.276	
L <sub>1</sub>	—	0.38	—	0.015	

NOTES:

- INTERNAL OPTICAL HEIGHT = 0.70±0.04[0.028±0.0015]
- BENT LEADS SHOULD NOT EXTEND OUTSIDE DIAMETER (φD) OF CAP OR TOUCH EACH OTHER.
- ALL DIMENSIONS ARE REFERENCE ONLY, EXCEPT A, φD & h.
- DETECTOR DIODE PLACEMENT ACCURACY: ± 0.15MM[0.006] WITH RESPECT TO CENTER OF HEADER: REFERENCE ONLY.
- CAN PLACEMENT ACCURACY: ± 0.2MM[0.008] WITH RESPECT TO CENTER OF HEADER: REFERENCE ONLY.

## Ordering Information

Part Number	Package Option	Package Description
AMT8302T56F	TO-56F	Ultra Flat Window Package



**ANADIGICS, Inc.**

141 Mount Bethel Road

Warren, New Jersey 07059, U.S.A

Tel: +1 (908) 668-5000

Fax: +1 (908) 668-5132

<http://www.anadigics.com>

[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 Advanced Product data sheets and product specifications contained in this data sheet are subject to change prior to a products formal introduction. The information in this data sheet has been carefully checked and is 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.