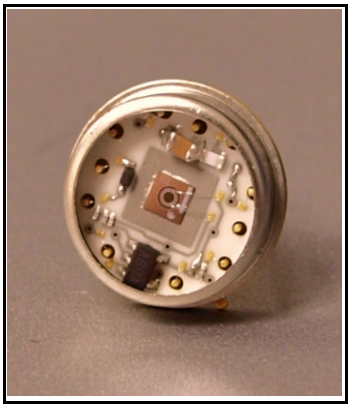
First Sensor

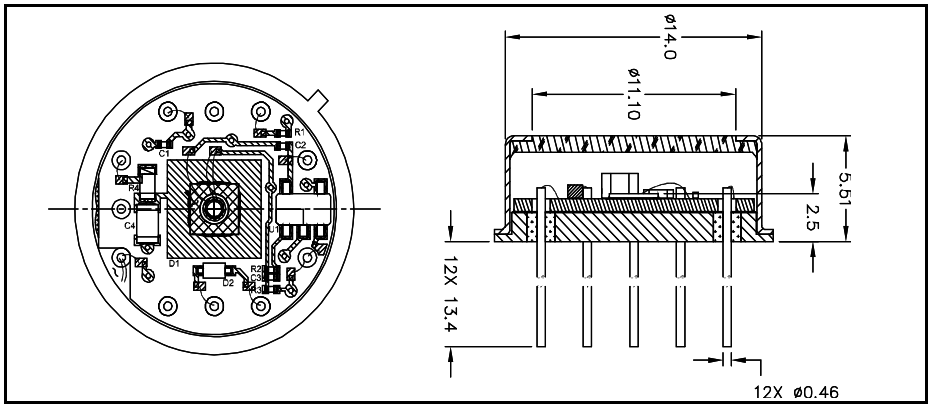
First Sensor Hybrid Data Sheet

Part Description MOD501387

Order # 501387

Version 19-07-12





Features

- ø 800 µm active area
- High QE for λ = 850-1064 nm
- Low noise
- Low slope multiplication curve
- High-speed, low noise TIA

Description

Hybrid with transimpedance amplifier and IR - enhanced APD chip. Very low dark current due to guard ring diode. Metal can type hermetic TO8Si package.

Application

- Pulsed 1064 nm laser detection
- Laser range finding
- Fluorescence detection

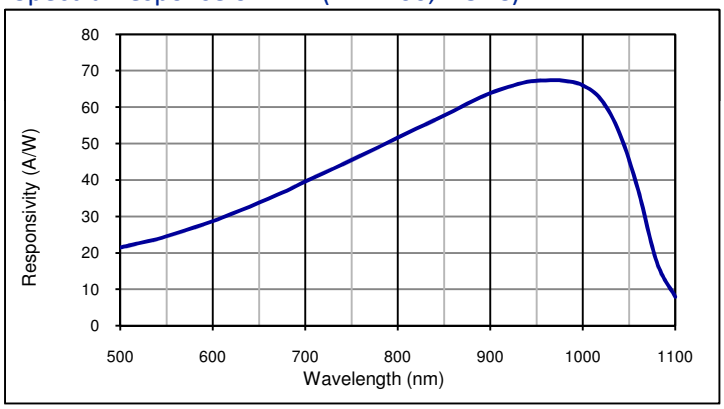
RoHS

2002/95/EC

Absolute maximum ratings

Symbol	Parameter	Min	Max	Unit
T_{STG}	Storage temp	-55	125	°C
T_{OP}	Operating temp	-40*	85	°C
M_{max}	Overall gain	2.2 E7		

Spectral response of APD (M = 100; 23 °C)



Electro-optical characteristics of APD chip @ 23°C

Symbol	Characteristic	Test Condition	Min	Typ	Max	Unit
	Active area			ø 800		µm
	Active area			0.5		mm²
I_D	Dark current	M = 100		3	25	nA
C	Capacitance	M = 100		1		pF
	Responsivity	M = 100; λ = 905 nm		65		A/W
	Responsivity	M = 100; λ = 1064 nm		36		A/W
t_R	Rise time	M = 100; λ = 1064 nm; R_L = 50 Ω		5		ns
t_R	Cut-off frequency	-3dB		70		MHz
V_{BR}	Breakdown voltage	I_R = 2 µA	220	300	600	V
	Temperature coefficient			3.3		V/K

* please note that depending on operation voltage APD operation at temperatures below -15°C may require sophisticated control circuit.

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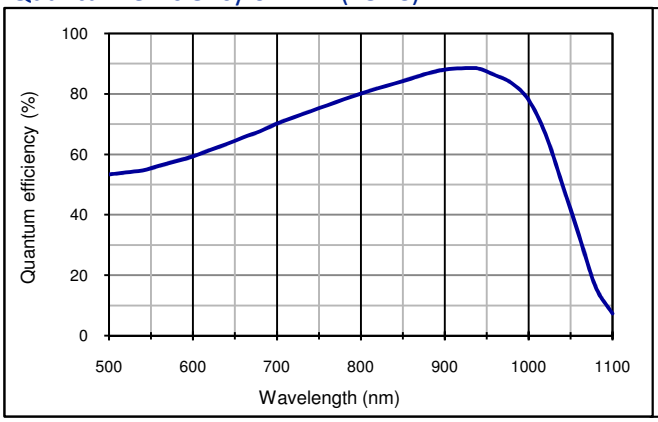
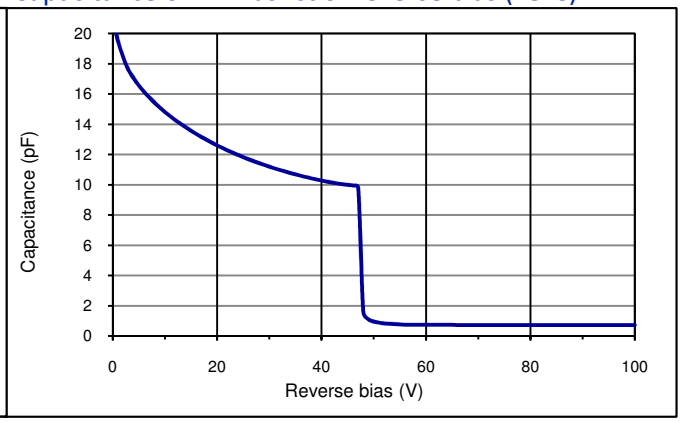
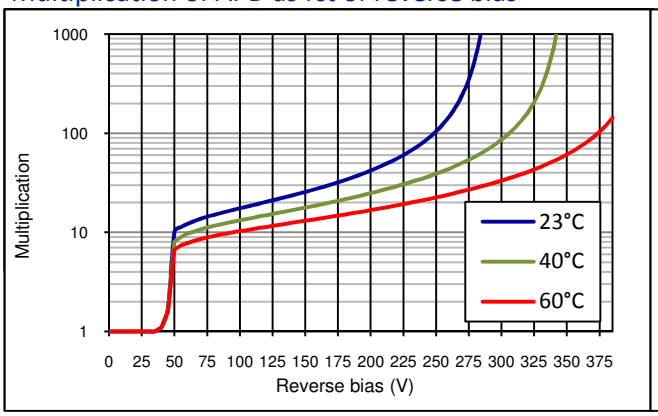
Quantum efficiency of APD (23 °C)



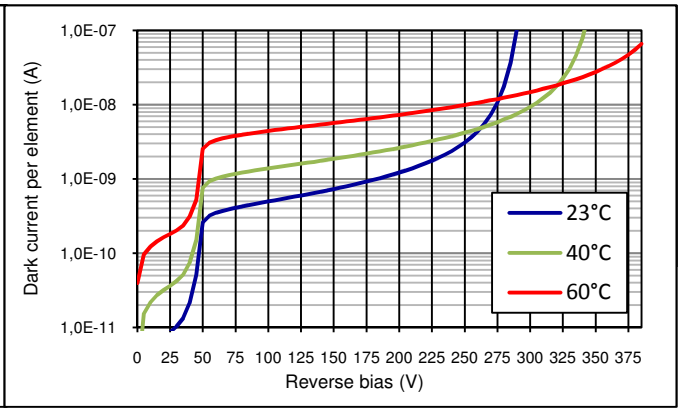
Capacitance of APD as fct of reverse bias (23°C)



Multiplication of APD as fct of reverse bias



Dark current of APD as fct of reverse bias



Characteristics of Hybrid @ 23°C

Part	Characteristic	Test Condition	Min	Typ	Max	Unit
Amplifier	Supply voltage		+/- 4.5	+/- 5	+/- 5.5	V
Amplifier	Supply current			7		mA
Amplifier	Transimpedance			**10**		kΩ
Amplifier	Output impedence			50		Ω
Amplifier	Differential output voltage				7 (+/-3.5)	V
Amplifier	Rise time	1 Volt Step		1.6		ns
Amplifier	Voltage noise	1 MHz		3.1		nV/√Hz
Amplifier	Current noise	1 MHz		1.6		pV/√Hz
Amplifier	Bandwidth	-3 db		**65**		MHz
Amplifier	Power supply rejection ratio			73		db
Amplifier	Offset voltage typical			0.8		mV
Amplifier	Coupling		AC (10 kHz min. signal frequency)			
Amplifier	Offset voltage typical			0.8		mV
Amplifier	Imput resistance			1		MΩ
T-Diode	Temperature coefficent			2.2		mV / °C

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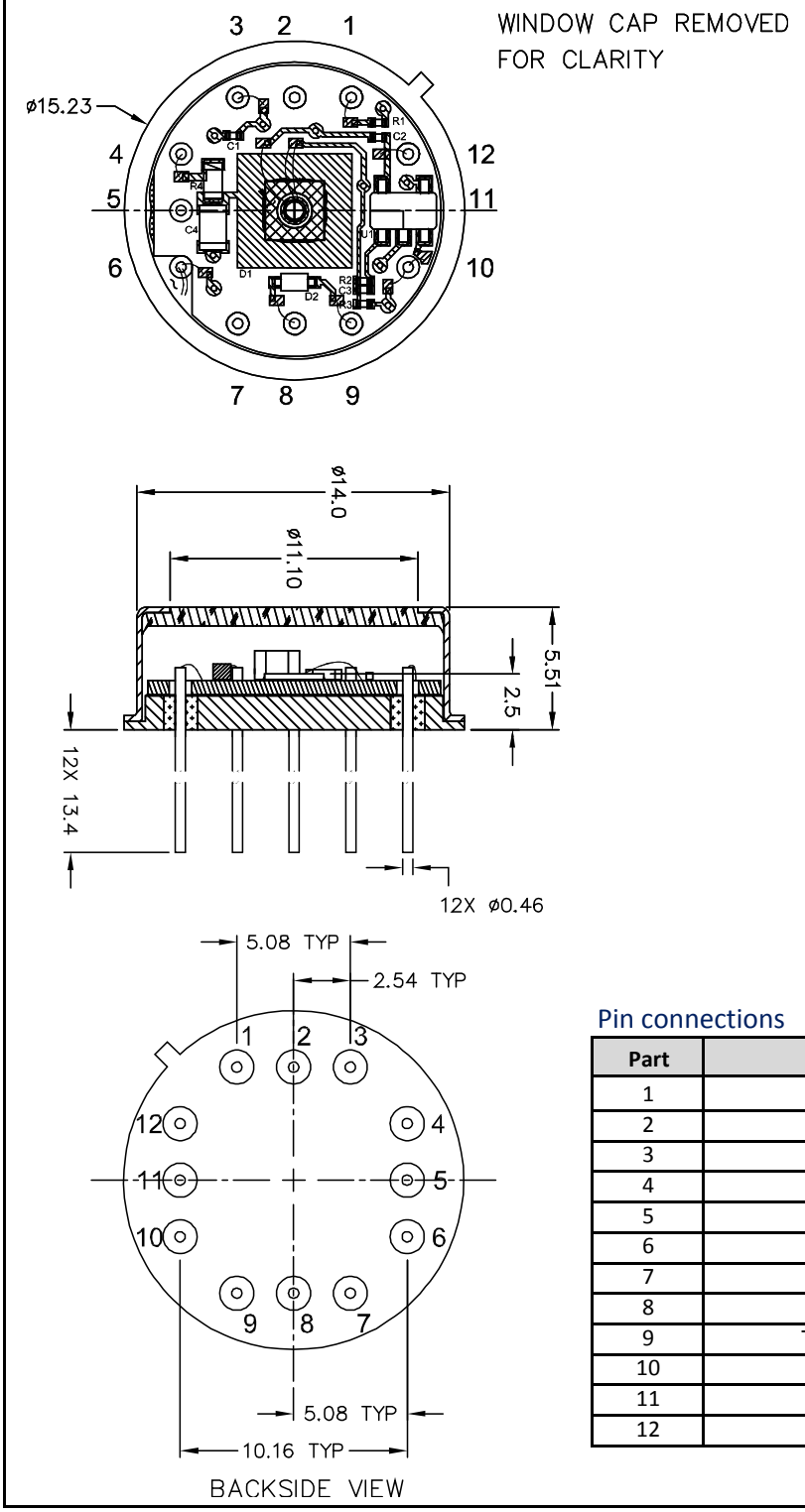

Pin connections

Part	Function
1	Signal output
2	No connection
3	-Vcc negative amplifier bias
4	Negative high voltage
5	No connection
6	Case ground
7	No connection
8	Temperature sensing diode - anode
9	Temperature sensing diode - cathode
10	Ground, DC returns
11	No connection
12	+Vcc positive amplifier bias

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