

General Description

Optical device consisting of a 6 chips silicon P/N photodiode array with high uniformity for the output signals. The device gives its best performances reverse biased, as it is based on PiN diodes.

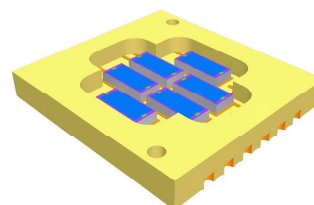
The active area of each silicon die is 2.5 x 1.1 mm².

The high optical responsivity is due to optimized antireflective coating deposited on the photodiode active areas.

The dark current is excellent for high temperature applications.

The materials have been selected in order to obtain the best performances in the whole temperature range.

OID7 is fully compatible with other standard parts on the market, like OPR2100, OL2100, PA2100; it has a special design both in the silicon die (front end) and in the package (back end), that increases the component reliability.



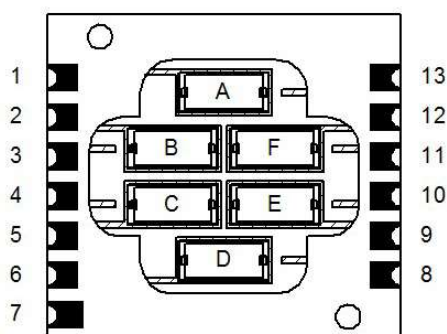
Applications

Incremental Rotative Encoders

Incremental Linear Encoders

General Purpose

TOP VIEW



Features

- High Responsivity (> 0.65 A/W @ □ = □p)
- High quantum efficiency (> 90% @ Vr=5V)
- Extended temperature range -40°C +125°C
- Wide active area
- Fast response time
- Low Dark Current
- Fully compatible with OPR2100-OL2100-PA2100

Pin Functions

No.	Name	Function
1	AK	Photodiode A Cathode
2	BK	Photodiode B Cathode
3	BA	Photodiode B Anode
4	CA	Photodiode C Anode
5	CK	Photodiode C Cathode
6	DK	Photodiode D Cathode
7	BG	Background Contact
8	DA	Photodiode D Anode
9	EK	Photodiode E Cathode
10	EA	Photodiode E Anode
11	FA	Photodiode F Anode
12	FK	Photodiode F Cathode
13	AA	Photodiode A Anode

Ordering Information

OID7 6 Chip Silicon P/N Photodiode Array with Active Area of the Silicon Die 2.5 x 1.1 mm².

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Min	Max	Unit
T _A	Operating Temperature Range	-40	125	°C
T _S	Storage Temperature	-40	125	°C
T _{sol}	Lead Temperature (solder) 3s		260	°C
V _{R(BR)}	Reverse Breakdown Voltage @ T _A =25°C I _R =100µA	40		V
R _{DA}	Thermal resistance die to ambient (package)		110	°C/W

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Filling material is sensitive to high pressure or vacuum, that can limit the absolute maximum ratings. Exposure to absolute maximum rated conditions for extended periods may affect device reliability.

ELECTRICAL CHARACTERISTICS

T_A = 25°C unless otherwise noted.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
I _D	Dark Current	T=25°C V _R =5V		0.35	5	nA
		T=125°C V _R =5V		5		µA
R _λ	Responsivity	V _R =5V λ=950nm	0.5	0.65		A/W
λ _p	Peak Responsivity	V _R =5V		950		nm
Δλ	Spectral Bandwidth @ 50%	V _R =5V	600		1050	nm
V _F	Forward Voltage	I _F =10mA		0.85		V

AC SWITCHING CHARACTERISTICS

T_A = 25°C unless otherwise noted.

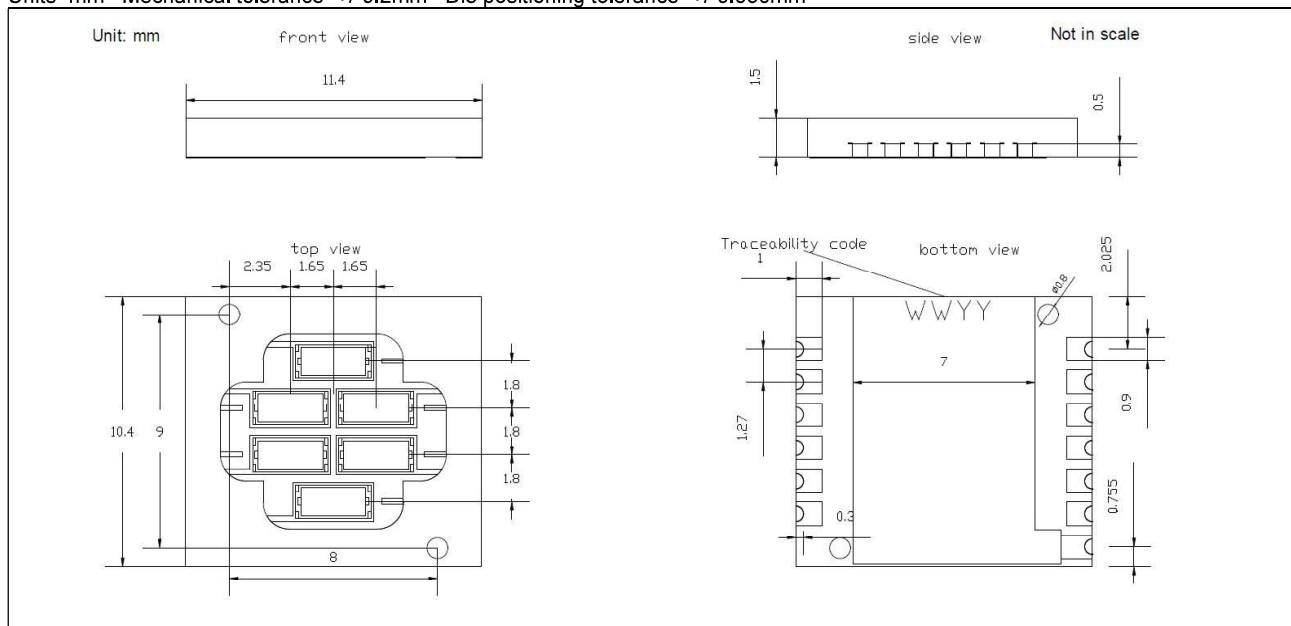
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
t _R	Rise time (10%...90%)	V _R =20V R _L =50Ω λ=650nm I _p =250µA		40		ns
t _F	Fall time (90%...10%)			40		ns
C	Capacitance	V _R =0V f=10kHz φ=0		20	30	pF

MECHANICAL CHARACTERISTICS

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
A	Active Area			2.75		mm ²
L	Length of the Active Area			2.5		mm
W	Width of the Active Area			1.1		mm

MECHANICAL DIMENSIONS

Units=mm Mechanical tolerance=+/-0.2mm Die positioning tolerance=+/-0.030mm



PACKAGE CHARACTERISTICS

Symbol	Parameter	Value	Unit
S _F	Pad Surface Finishing	GOLD	
S _L	Pad Shelf Life	6	months
MSL	Moisture Sensitive Level	3	level

TYPICAL PERFORMANCE CURVES

Figure 1 Spectral Responsivity
 Conditions: collimated light (light spot inside the active area of the photodiode), Ta=25°C

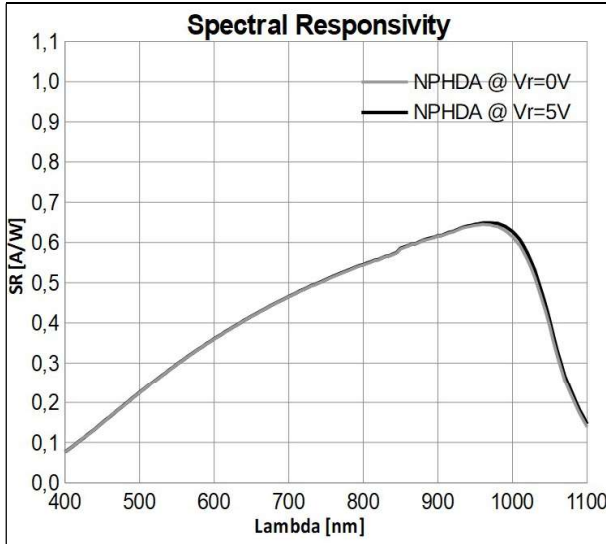


Figure 3 Dark current Vs Temperature
 Conditions: Vrev=5V, E=0

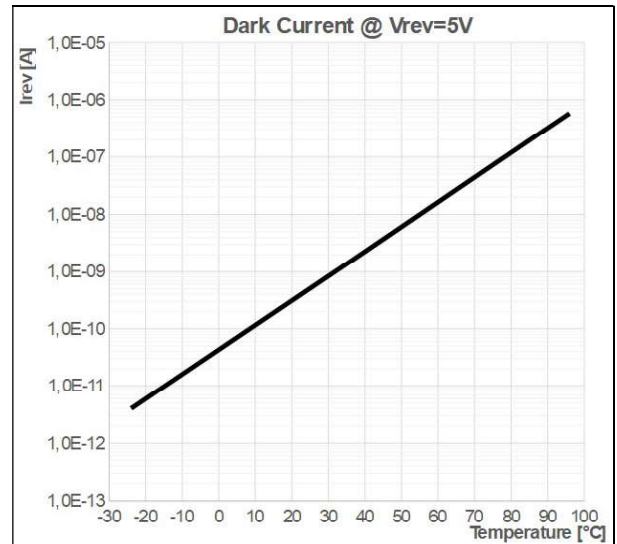


Figure 2 Photocurrent Vs Reverse Voltage
 Conditions: collimated red light 2,5x1,25mm², Iph=500uA, Vrev=5V, Ta=25°C

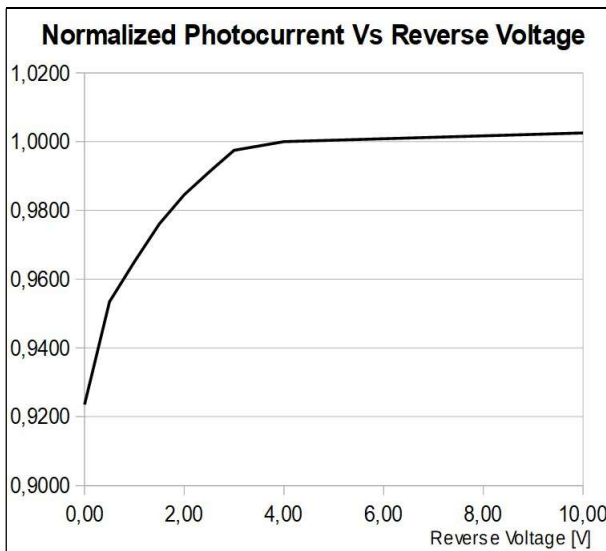


Figure 4 Junction Capacitance Vs Temperature
 Conditions: Vrev=0V, f=10kHz

