

## General Description

OIT12C consists in a silicon phototransistor's monolithic array.

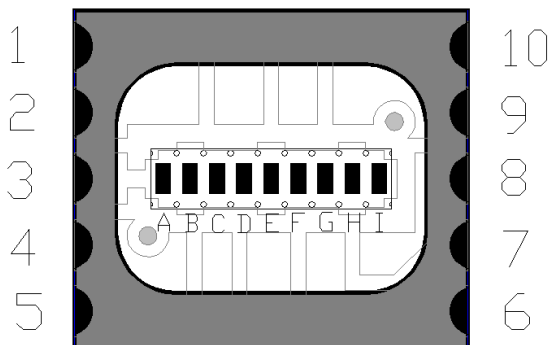
The phototransistors have a common collector, every emitter is available as a pad. The pitch of the silicon arrays is 0.45 mm, while the component electrical pitch is 1.10 mm. The active area of each element is 0.25 x 0.50 mm. The encapsulant is an high quality microelectronic transparent resin, its transmission value is 100% in the range 300-900nm.

The advantages of this product are the high uniformity of the silicon sensors, due to the monolithic construction, the high stability of the signal and the high optical responsivity, due to the antireflective coating deposited on the phototransistor's areas.

The packaging method is oriented to industrial harsh applications, which means high temperature range, high stability in time and very high uniformity of the silicon cells. The package dimensions are reduced to the minimum, in order to optimize the costs. Two reference marks are available for the precise collimator positioning.

## Applications

Optical encoders  
Incremental encoders  
Optical Receivers  
Controls/drives  
Light sensors



TOP VIEW



## Features

- High uniformity
- High gain
- High transparency resin
- Very small dimensions
- Designed to meet industrial specifications
- Reference points for precise mounting
- Custom design available
- 0.45 mm optical pitch
- RoHS compliant

## Pin Functions

No.	Name	Function
1	EE	Phototransistor E Emitter
2	CE	Phototransistor C Emitter
3	AE	Phototransistor A Emitter
4	BE	Phototransistor B Emitter
5	DE	Phototransistor D Emitter
6	FE	Phototransistor F Emitter
7	HE	Phototransistor H Emitter
8	CC	Common collector
9	IE	Phototransistor I Emitter
10	GE	Phototransistor G Emitter

## Ordering Information

OIT12C-9	9 elements monolithic SMD phototransistor
OIT12C-6	6 element monolithic SMD phototransistor
OIT12C-4	4 element monolithic SMD phototransistor

# OIT12C-X

## ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Min	Max	Unit
T <sub>A</sub>	Operating Temperature Range	-40	100	°C
T <sub>S</sub>	Storage Temperature	-40	100	°C
T <sub>Sol</sub>	Lead Temperature (solder) 3s		230	°C
V <sub>R(BR)</sub>	Breakdown Voltage Collector-Emitter @ T <sub>A</sub> =25°C I <sub>B</sub> =100nA I <sub>C</sub> =1mA	50		V
P <sub>D</sub>	Power Dissipation @ T <sub>A</sub> =25°C		150	mW

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. Exposure to absolute maximum rated conditions for extended periods may affect device reliability.

## ELECTRICAL CHARACTERISTICS

T<sub>A</sub> = 25°C unless otherwise noted.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
I <sub>D</sub>	Dark Current	V <sub>R</sub> =10V		5	100	nA
R <sub>λ</sub>	Responsivity	V <sub>CE</sub> =5V λ=880nm	0.5			A/W
λ <sub>p</sub>	Peak Responsivity	V <sub>CE</sub> =5V		750		nm
Δλ	Spectral Bandwidth @ 50%	V <sub>CE</sub> =5V	500		950	nm
I <sub>ec0</sub>	Emitter-Collector Current	V <sub>CE</sub> =7.7V		0.025	100	μA
I <sub>ce0</sub>	Collector-Emitter Current	V <sub>CE</sub> =52V		0.025	100	μA
H <sub>FE</sub>	Gain	V <sub>CC</sub> =5V I <sub>C</sub> =2mA	500	750	1000	
V <sub>CE(sat)</sub>	Saturation Voltage	I <sub>E</sub> =2mA I <sub>B</sub> =20μA		130	200	mV
I <sub>C(on)</sub>	On-state Collector Current	V <sub>CE</sub> =5V E <sub>E</sub> =1.0mW/cm <sup>2</sup>		1		mA

## AC SWITCHING CHARACTERISTICS

T<sub>A</sub> = 25°C unless otherwise noted.

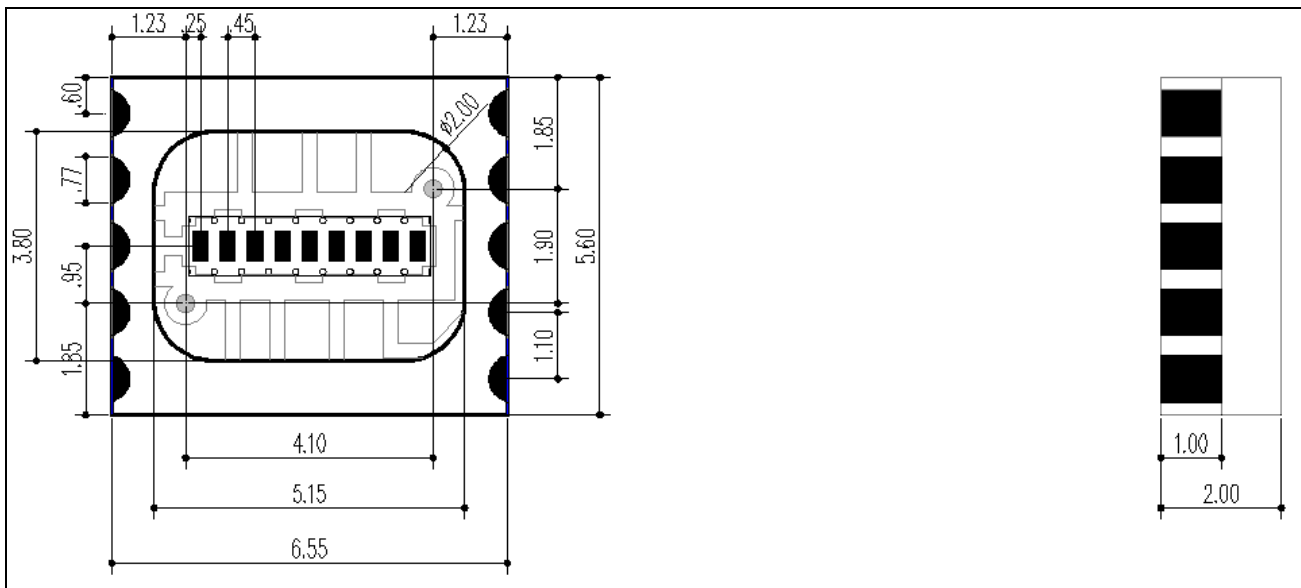
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
t <sub>R</sub>	Rise Time	V <sub>CC</sub> =5V I <sub>C</sub> =1mA R <sub>1</sub> =1kΩ		10		μs
t <sub>F</sub>	Fall Time	V <sub>CC</sub> =5V I <sub>C</sub> =1mA R <sub>1</sub> =1kΩ		11		μs

## MECHANICAL CHARACTERISTICS

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
A	Phototransistor Active Area			0.125		mm <sup>2</sup>
L	Length of the Active Area			0.25		mm
W	Width of the Active Area			0.50		mm

## MECHANICAL DIMENSIONS

Units=mm Mechanical tolerance=±0.2mm Die positioning tolerance=±0.030mm



TYPICAL PERFORMANCE CURVES

Figure 1 – Output voltage Vs Temperature

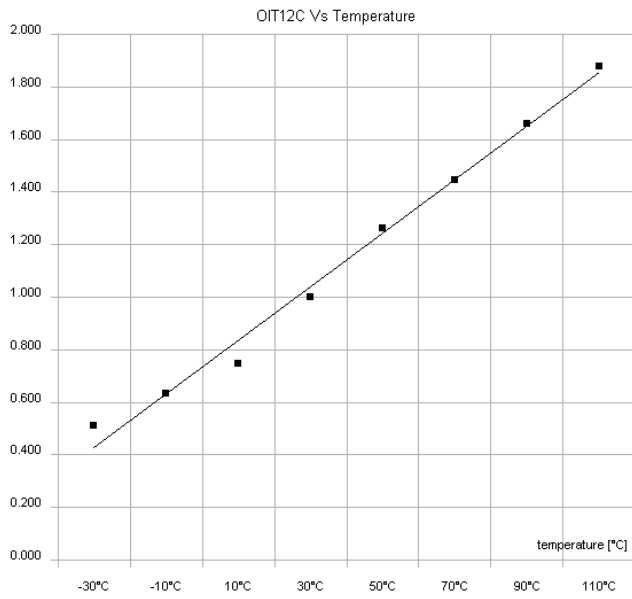


Figure 2 – Normalized spectral responsivity

