

## General Description

OIT15C consists in a silicon phototransistor's monolithic array. The phototransistors have a common collector on the back substrate, which is tied to a single pad and every emitter is accessible to specific pad. The optical pitch of the array is 0.45 mm, the LCC package electrical pitch is 1.10 mm. The active area of each element is 0.25 x 0.50 mm<sup>2</sup>.

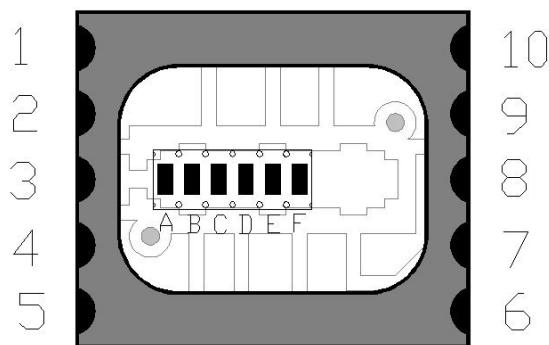
The advantages of this product are the high uniformity of the silicon sensors, due to the monolithic construction and to the extremely controlled microelectronic process, the high stability of the signal and the high optical responsivity, due to the antireflective coating deposited on the phototransistor's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

The encapsulant is a clear epoxy material, having high hardness and high optical performances (transmittance close to 100% in the range 300-900nm). The S version has another encapsulant type, less hard, silicone based, in order to reach an extended temperature range.

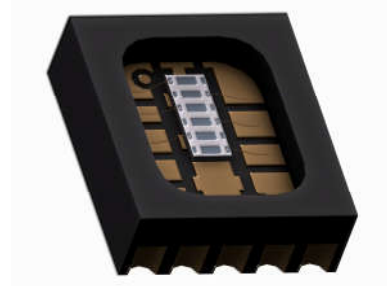
The size is reduced to the minimum, in order to optimize the cost and the encoder space. Two reference marks are available for the precise collimator positioning.

## Applications

Optical encoders  
Incremental encoders  
Optical Receivers  
Controls/drives  
Light sensors



TOP VIEW



## Features

- High uniformity of silicon cells
- Smaller optical pitch, wider active area
- High transparency resin
- High gain
- Very small dimensions
- Reference points for precise mounting

## Pin Functions

No.	Name	Function
1	DE	Phototransistor D Emitter
2	BE	Phototransistor B Emitter
3	CC	Common collector
4	AE	Phototransistor A Emitter
5	CE	Phototransistor C Emitter
6	EE	Phototransistor E Emitter
7	N.C.	Not connected
8	N.C.	Not connected
9	N.C.	Not connected
10	FE	Phototransistor F Emitter

## Ordering Information

OIT15C	6-ch. phototransistor array 0.45mm optical pitch , hard glob top resin
OIT15C-S	6-ch. phototransistor array 0.45mm optical pitch , soft glob top resin

**ABSOLUTE MAXIMUM RATINGS**

Symbol	Parameter	Min	Max	Unit
T <sub>A</sub>	Operating Temperature Range, standard version	-40	85	°C
	Operating Temperature Range, S version	-40	100	
T <sub>S</sub>	Storage Temperature, standard version	-40	85	°C
	Storage Temperature, S version	-40	100	
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
ESDS	Electrostatic Discharge Susceptibility (Human Body Model, ESDC20800)		3	class

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	1100	1500	
V <sub>CE(sat)</sub>	Saturation Voltage	I <sub>E</sub> =2mA I <sub>B</sub> =20μA		80	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

**PACKAGE CHARACTERISTICS**

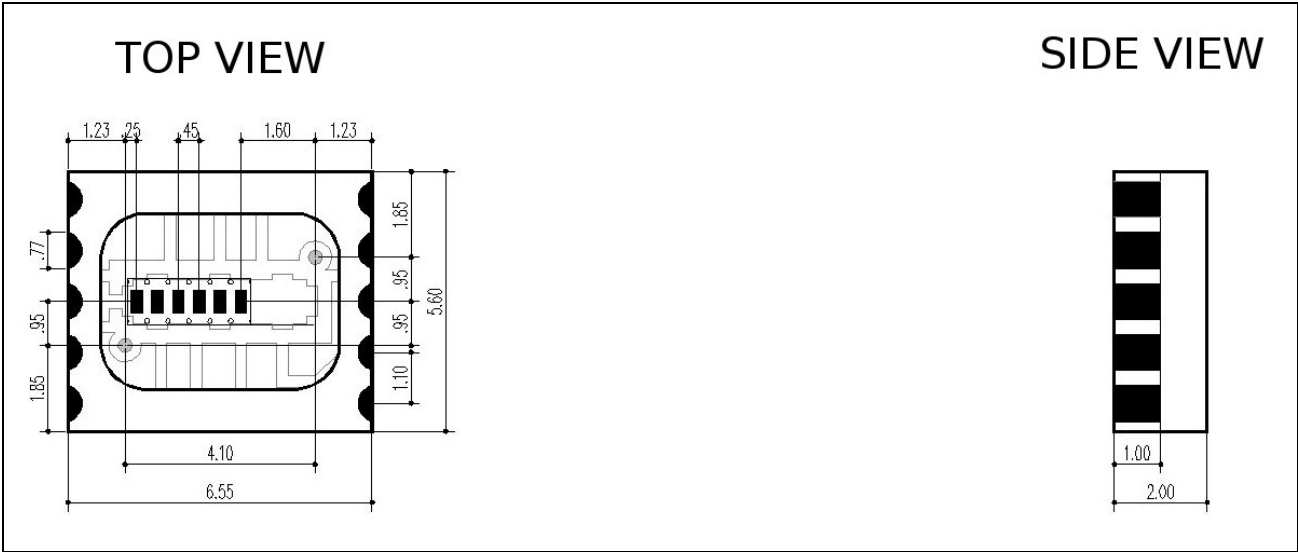
Symbol	Parameter	Value	Unit
S <sub>F</sub>	Pad Surface Finishing	GOLD	
S <sub>L</sub>	Pad Shelf Life	6	months
MSL	Moisture Sensitive Level, standard version †	5	level
	Moisture Sensitive Level, S version	3	level

† According to Jedec standard J-STD-020D.1

Note: if a baking is required, please note that the standard version must be baked at temperature below max rating

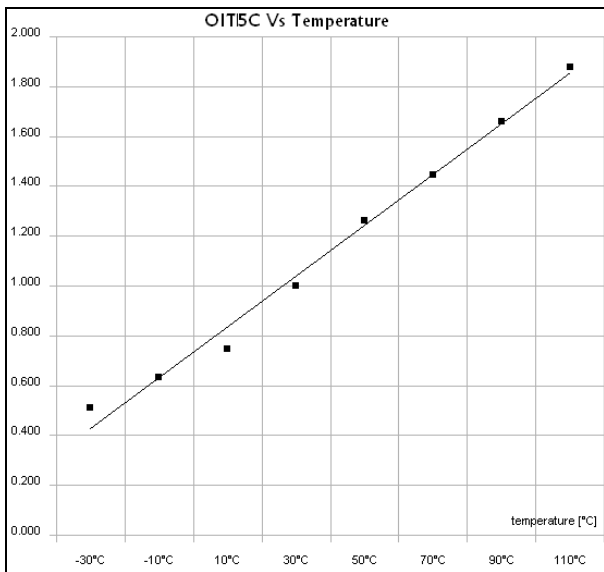
**MECHANICAL DIMENSIONS**

Units=mm Mechanical tolerance= $\pm 0.2$ mm Die positioning tolerance= $\pm 0.030$ mm



**TYPICAL PERFORMANCE CURVES**

**Figure 1 – Output voltage Vs Temperature**



**Figure 2 – Normalized spectral responsivity**

