

## General Description

OIT15C-NR 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>.

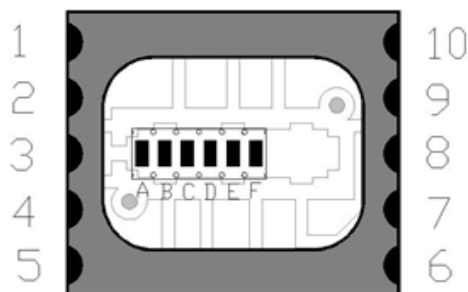
The advantages of this product are the high uniformity of the silicon sensors, due to the monolithic construction and to the extremely controlled microelectronic process, the high stability of the signal and the high optical responsivity, due to the antireflective coating deposited on the phototransistor's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

The device is protected with a thin plastic film, that is resistant to reflow oven processes. The film has to be removed once the device has been assembled on the electronic board and the user can attach the optical reticle.

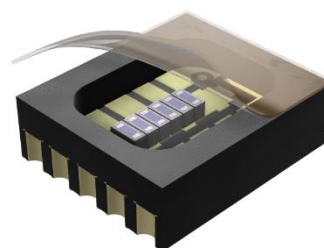
The size is reduced to the minimum, in order to optimize the cost and the encoder space. Two reference marks are available for the precise reticle positioning.

## Applications

Optical encoders  
 Incremental encoders  
 Optical Receivers  
 Controls/drives  
 Light sensors



TOP VIEW



## Features

- Resistant to soldering processes, MSL2
- High uniformity of the silicon cells
- Smaller optical pitch, wider active area
- High gain
- Very small dimensions
- Reference points for precise mounting
- Reticle assembly service available

## 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-NR** 6-ch. phototransistor array 0.45mm optical pitch on plastic SMD package, no encapsulant

**ABSOLUTE MAXIMUM RATINGS**

Symbol	Parameter	Min	Max	Unit
$T_R$	Operating Temperature Range	-40	100	°C
$T_S$	Storage Temperature	-40	100	°C
$T_{Sol}$	Lead Temperature (solder) 3s		230	°C
$V_{R(BR)}$	Breakdown Voltage Collector-Emitter @ $T_A=25^\circ\text{C}$ $I_B=100\text{nA}$ $I_C=1\text{mA}$	50		V
$P_D$	Power Dissipation @ $T_A=25^\circ\text{C}$		150	mW
ESDS	Electrostatic Discharge Susceptibility (Human Body Model, ESCC20800)		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**

$T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_D$	Dark Current	$V_R=10\text{V}$		5	100	nA
$R_\lambda$	Responsivity	$V_{CE}=5\text{V}$ $\lambda=880\text{nm}$	0.5			A/W
$\lambda_p$	Peak Responsivity	$V_{CE}=5\text{V}$		750		nm
$\Delta\lambda$	Spectral Bandwidth @ 50%	$V_{CE}=5\text{V}$	500		950	nm
$I_{ec0}$	Emitter-Collector Current	$V_{CE}=7.7\text{V}$		0.025	100	$\mu\text{A}$
$I_{ce0}$	Collector-Emitter Current	$V_{CE}=52\text{V}$		0.025	100	$\mu\text{A}$
$H_{FE}$	Gain	$V_{CC}=5\text{V}$ $I_C=2\text{mA}$	500	1100	1500	
$V_{CE(sat)}$	Saturation Voltage	$I_E=2\text{mA}$ $I_B=20\mu\text{A}$		80	200	mV
$I_{C(on)}$	On-state Collector Current	$V_{CE}=5\text{V}$ $E_E=1.0\text{mW/cm}^2$		1		mA

**AC SWITCHING CHARACTERISTICS**

$T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$t_R$	Rise Time	$V_{CC}=5\text{V}$ $I_C=1\text{mA}$ $R_1=1\text{k}\Omega$		10		$\mu\text{s}$
$t_F$	Fall Time	$V_{CC}=5\text{V}$ $I_C=1\text{mA}$ $R_1=1\text{k}\Omega$		10		$\mu\text{s}$

**MECHANICAL CHARACTERISTICS**

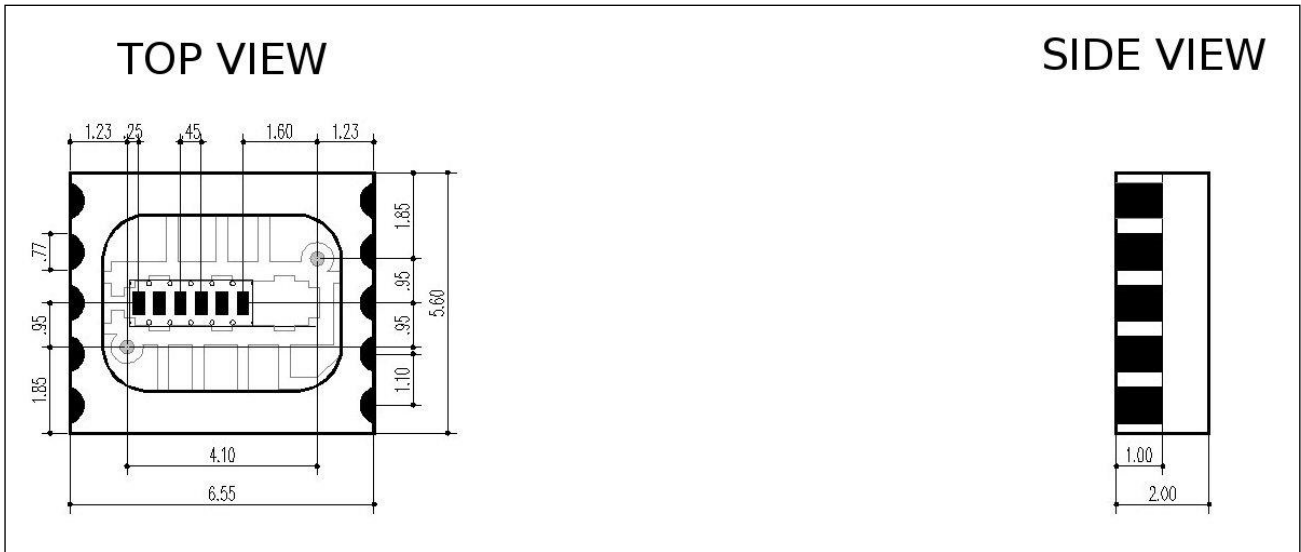
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
A	Phototransistor Active Area			0.125		$\text{mm}^2$
L	Length of the Active Area			0.25		mm
W	Width of the Active Area			0.50		mm

**PACKAGE CHARACTERISTICS**

Symbol	Parameter	Value	Unit
$S_F$	Pad Surface Finishing	GOLD	
$S_L$	Pad Shelf Life	6	months
MSL	Moisture Sensitive Level	2	level

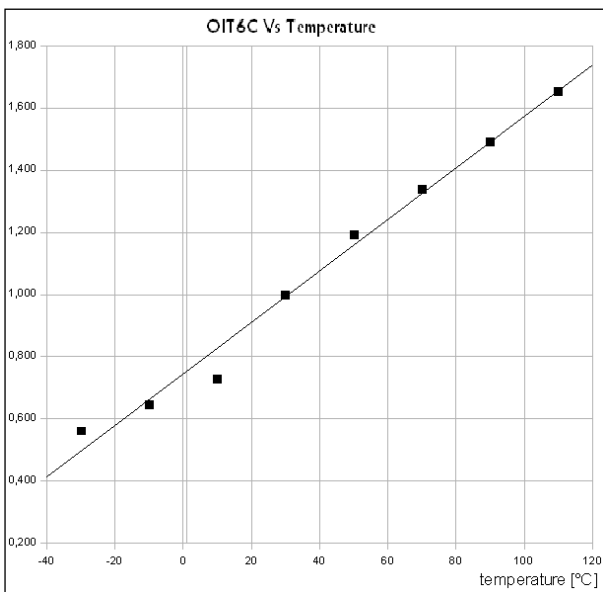
**MECHANICAL DIMENSIONS**

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**

