

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 mm².

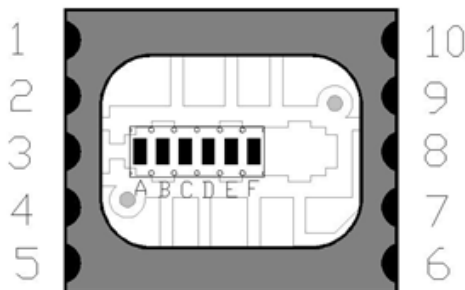
The advantages of this product are the high uniformity of the silicon sensors, due to the monolithic construction and to the extremely controlled microelectronic process, the high stability of the signal and the high optical responsivity, due to the antireflective coating deposited on the phototransistor's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

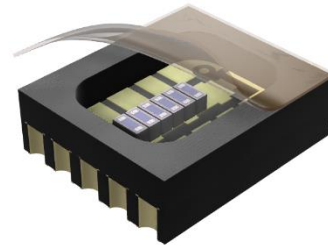
The size is reduced to the minimum, in order to optimize the cost and the encoder space. Two reference marks are available for the precise reticle positioning.

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_λ	Responsivity	$V_{CE}=5\text{V}$ $\lambda=880\text{nm}$	0.5			A/W
λ_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	μA
I_{ce0}	Collector-Emitter Current	$V_{CE}=52\text{V}$		0.025	100	μA
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		μs
t_F	Fall Time	$V_{CC}=5\text{V}$ $I_C=1\text{mA}$ $R_1=1\text{k}\Omega$		10		μs

MECHANICAL CHARACTERISTICS

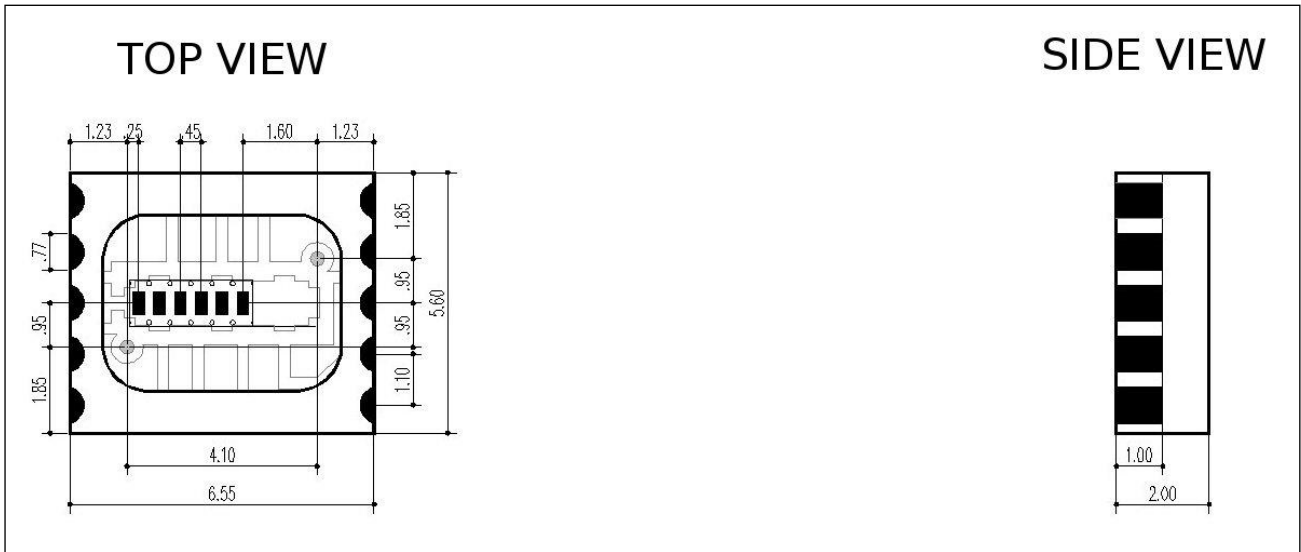
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
A	Phototransistor Active Area			0.125		mm^2
L	Length of the Active Area			0.25		mm
W	Width of the Active Area			0.50		mm

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



TYPICAL PERFORMANCE CURVES

Figure 1 – Output voltage Vs Temperature

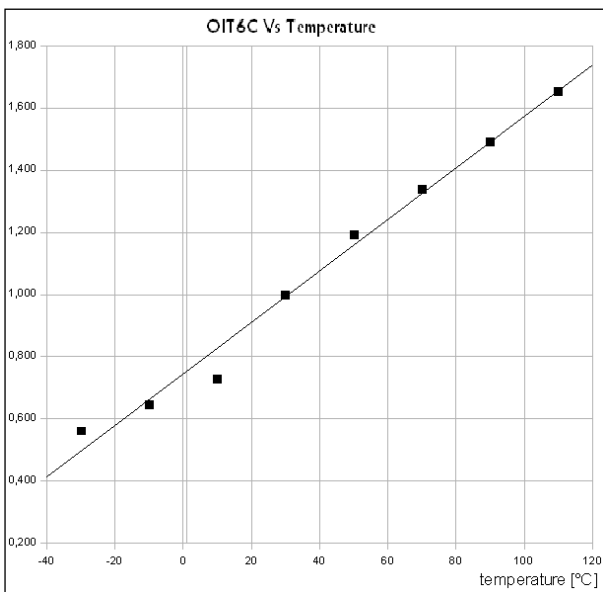


Figure 2 – Normalized spectral responsivity

