OIT15C-S

6-ch. phototransistor array 0.45mm optical pitch on plastic SMD package

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^2.

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 material, silicone based that permit 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

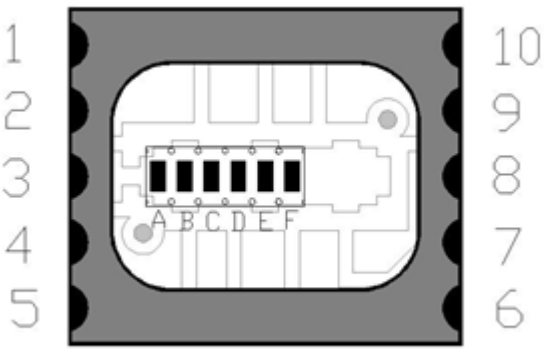
Optical encoders

Incremental encoders

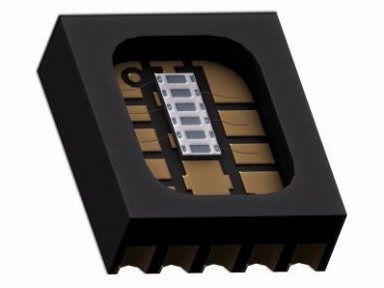
Optical Receivers

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

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ABSOLUTE MAXIMUM RATINGS

C	Parameter	Min	Max	Unit
	Operating Temperature Range	-40	100	°C
	Storage Temperature	-40	100	°C
T_{Sol}	Lead Temperature (solder) 3s		230	°C
$V_{R(BR)}$	Breakdown Voltage Collector-Emitter @ T_A=25°C I_B=100nA I_C=1mA	50		V
P_D	Power Dissipation @ T_A=25°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°C unless otherwise noted.

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

AC SWITCHING CHARACTERISTICS

T_A = 25°C unless otherwise noted.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
t_R	Rise Time	V_{CC}=5V I_C=1mA R_1=1kΩ		10		µs
t_F	Fall Time	V_{CC}=5V I_C=1mA R_1=1kΩ		10		µs

MECHANICAL CHARACTERISTICS

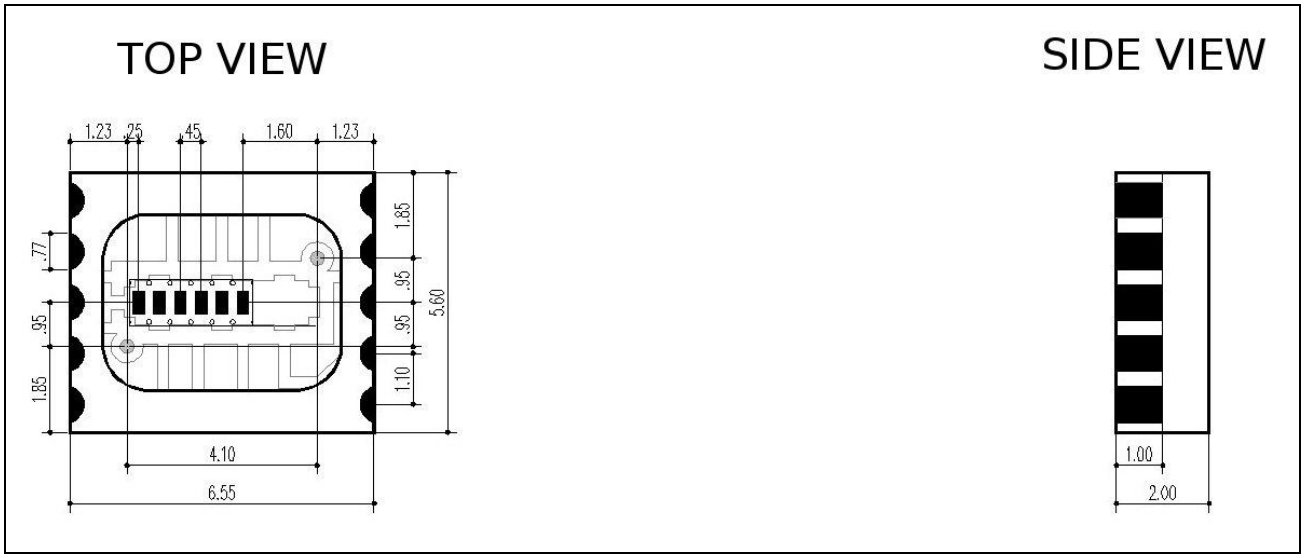
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
A	Phototransistor Active Area			0.125		mm^2
L	Length of the Active Area			0.25		mm
W	Width of the Active Area			0.50		mm

PACKAGE CHARACTERISTICS

Symbol	Parameter	Value	Unit
S_F	Pad Surface Finishing	GOLD	
S_L	Pad Shelf Life	6	months
MSL	Moisture Sensitive Level	3	level

MECHANICAL DIMENSIONS

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



TYPICAL PERFORMANCE CURVES

Figure 1 – Output voltage Vs Temperature

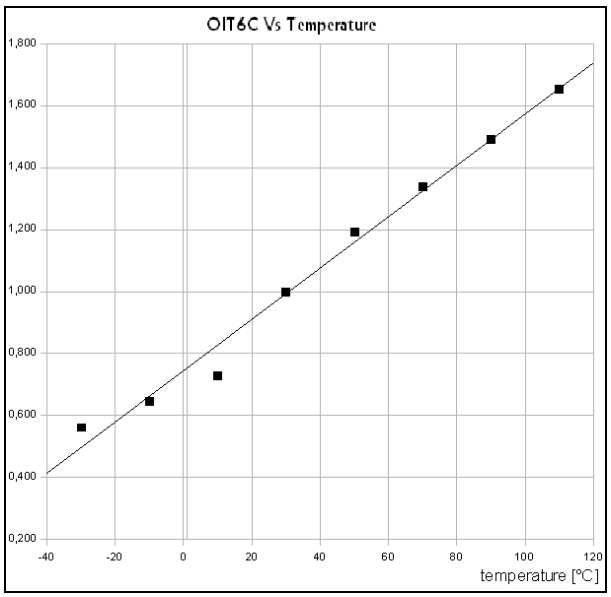


Figure 2 – Normalized spectral responsivity