

General Description

OIT12C 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 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

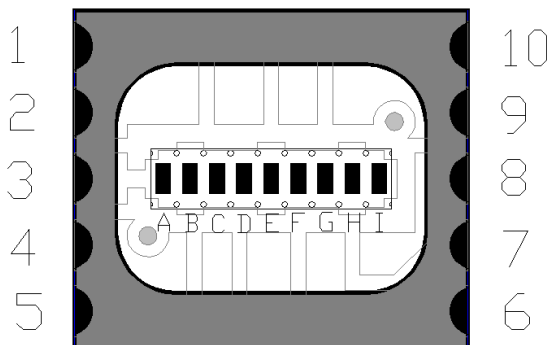


Features

- High uniformity of the 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	GE	Phototransistor G Emitter
8	IE	Phototransistor I Emitter
9	HE	Phototransistor H Emitter
10	FE	Phototransistor F Emitter



TOP VIEW

Ordering Information

OIT12C	9-ch. phototransistor array 0.45mm optical pitch , hard glob top resin
OIT12C-S	9-ch. phototransistor array 0.45mm optical pitch , soft glob top resin range

OIT12C-OIT12C-S

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Min	Max	Unit
T _A	Operating Temperature Range, standard version	-40	85	°C
	Operating Temperature Range, S version	-40	100	
T _S	Storage Temperature, standard version	-40	85	°C
	Storage Temperature, S version	-40	100	
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

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	600	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

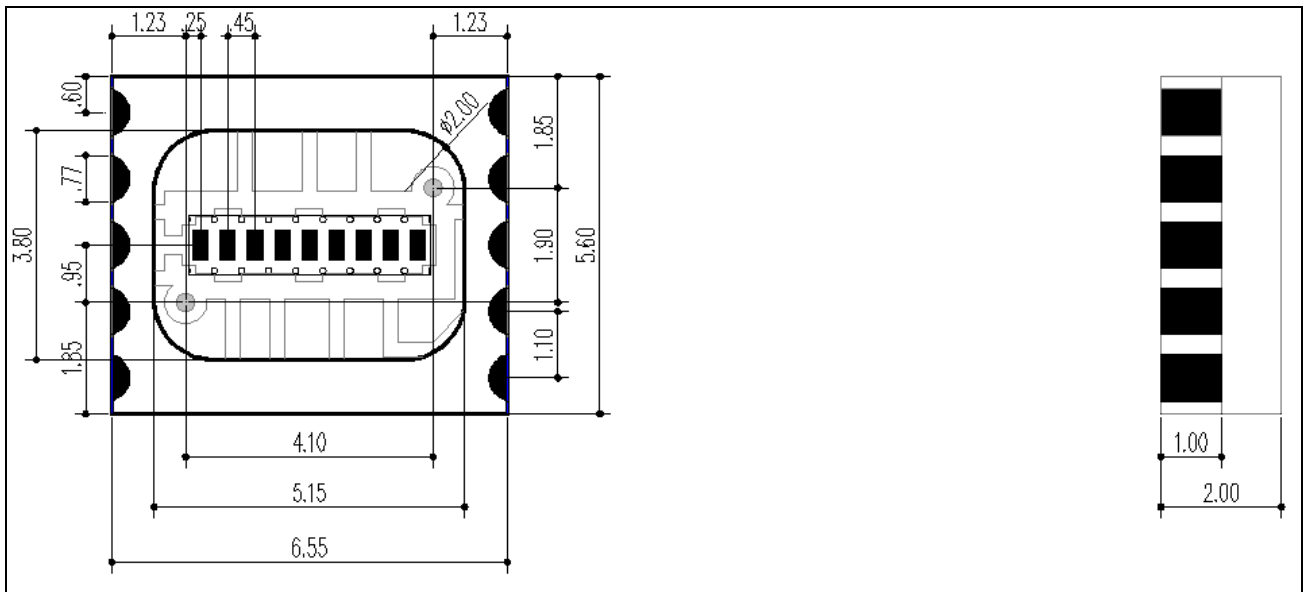
Symbol	Parameter	Value	Unit
S _F	Pad Surface Finishing	GOLD	
S _L	Pad Shelf Life	6	months
MSL	Moisture Sensitive Level, standard version †	5	level
	Moisture Sensitive Level, S version	3	level

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



TYPICAL PERFORMANCE CURVES

Figure 1 – Output voltage Vs Temperature

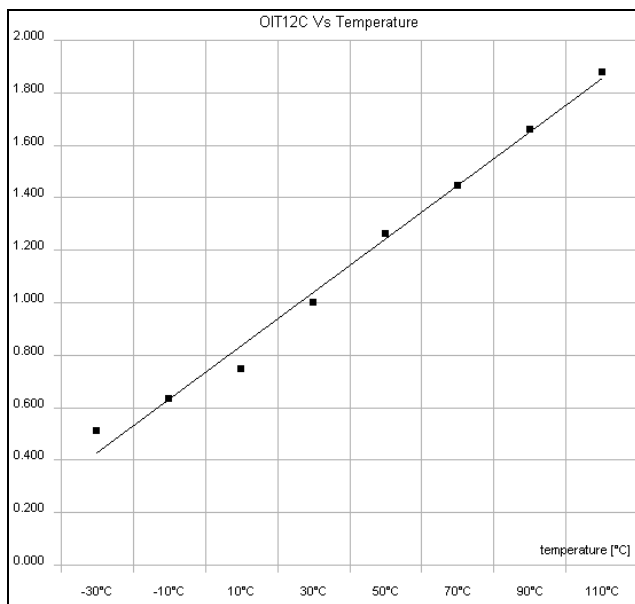


Figure 2 – Normalized spectral responsivity

