

General Description

OIT9C consists in a silicon phototransistor's monolithic array. The phototransistors have a common collector on the back substrate, which is tied to two pads and every emitter is accessible to specific pad. The optical pitch of the array is 0.60 mm, the LCC package electrical pitch is 1.27 mm. The active area of each element is 0.20 x 0.45 mm².

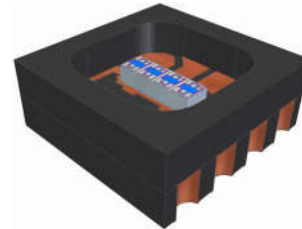
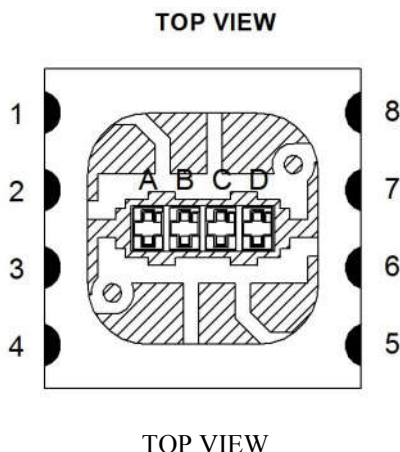
The advantages of this product are the high uniformity of the silicon sensors, due to the monolithic construction and to the extremely controlled microelectronic process, the high stability of the signal and the high optical responsivity, due to the antireflective coating deposited on the phototransistor's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

The encapsulant is a clear silicone material, having medium hardness, in order to be robust against RoHS soldering processes and high optical performances (transmittance close to 100% in the range 300-900nm).

The package material is an high quality plastic material, with high TG. 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

Extended temperature encoders
Optical encoders
Incremental encoders
Controls/drives



Features

- Very high uniformity of silicon cells
- High temperature range
- Robust packaging
- High transparency resin
- High gain
- Designed to meet industrial specifications
- Reference holes for precise mounting

Pin Functions

No.	Name	Function
1	BE	Phototransistor B Emitter
2	N.C.	Not connected
3	CC	Common Collector
4	AE	Phototransistor A Emitter
5	CE	Phototransistor C Emitter
6	N.C.	Not connected
7	CC	Common Collector
8	DE	Phototransistor D Emitter

Ordering Information

OIT9C	4-ch. phototransistor array 0.60mm optical pitch on plastic SMD package
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ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Min	Max	Unit
T _A	Operating Temperature Range	-40	85	°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°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		0.1	100	μA
I _{ce0}	Collector-Emitter Current	V _{CE} =52V		0.1	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.

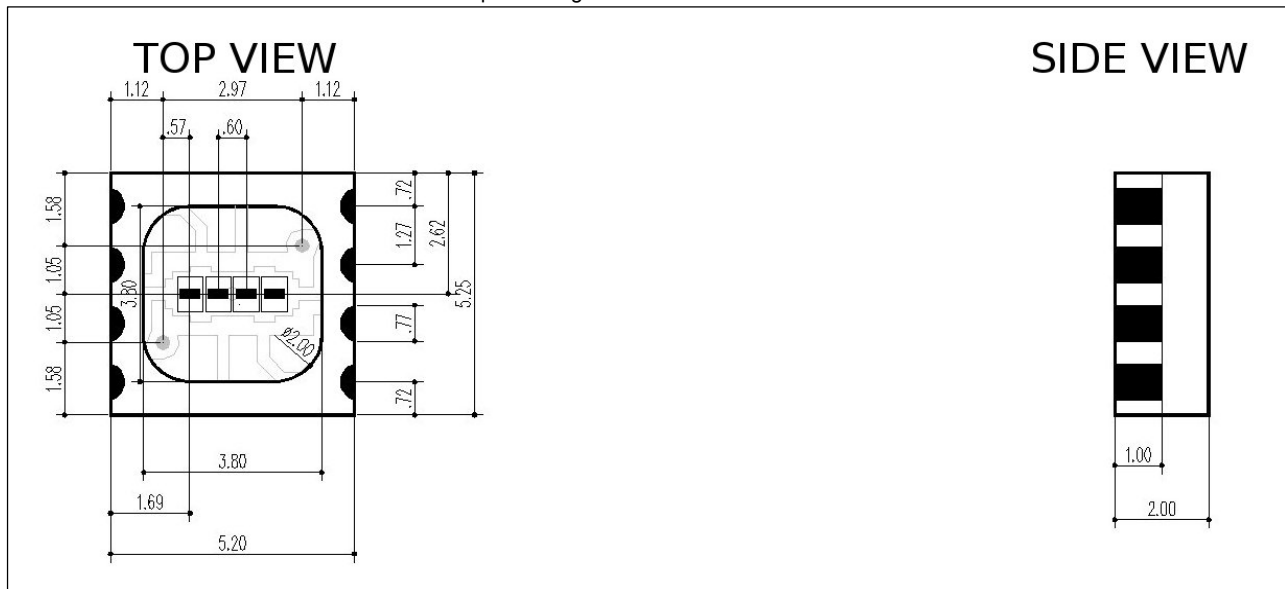
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
t _R	Rise Time	V _{CC} =5V I _C =1mA R _I =1kΩ		10		μs
t _F	Fall Time	V _{CC} =5V I _C =1mA R _I =1kΩ		11		μs

MECHANICAL CHARACTERISTICS

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
A	Phototransistor Active Area			0.09		mm ²
L	Length of the Active Area			0.2		mm
W	Width of the Active Area			0.45		mm

MECHANICAL DIMENSIONS

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



PACKAGE CHARACTERISTICS

Symbol	Parameter	Value	Unit
S _F	Pad Surface Finishing	GOLD	
S _L	Pad Shelf Life	6	months
MSL	Moisture Sensitive Level † (see note at bottom page)	3	level

TYPICAL PERFORMANCE CURVES

Figure 1 – Output voltage Vs Temperature

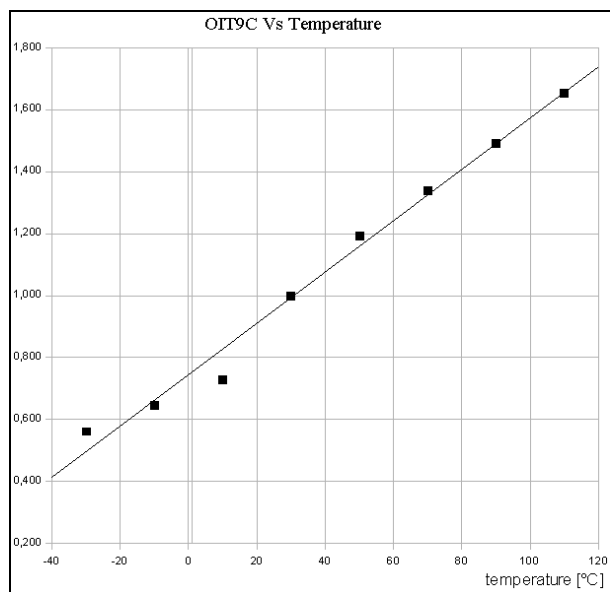
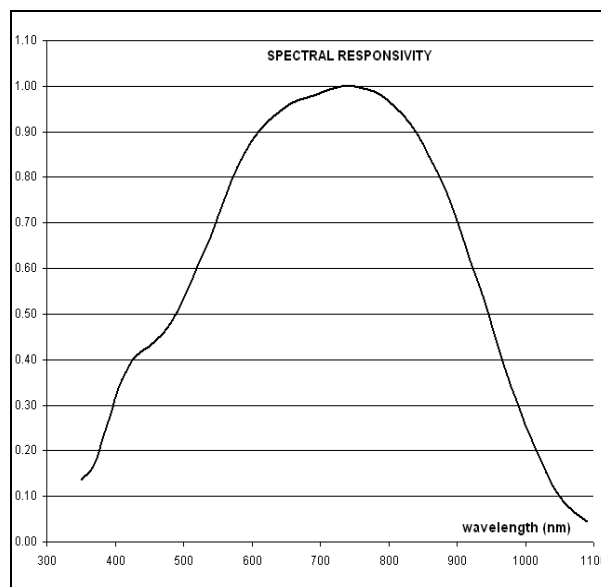


Figure 2 – Normalized spectral responsivity



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