

General Description

OIT7C-NR consists in three silicon phototransistor's monolithic arrays. The two arrays of six devices are placed on top and bottom of the device, they represent each bit of the encoder disc. A further array of four devices is placed in the center. It can be used as light sensor or as adding bits, increasing the resolution of the encoder.

The phototransistors have a common collector, every emitter is available as a pad. The pitch of the silicon arrays is 0.6 mm, while the component electrical pitch is 1.27 mm. The active area of each element is 0.2 x 0.45 mm.

The advantages of this product are the high uniformity of the silicon sensors, due to the monolithic construction 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.

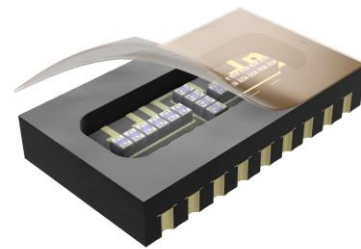
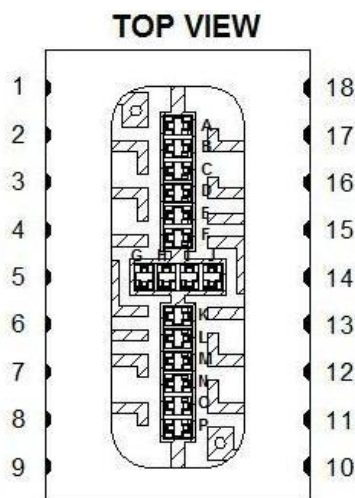
Applications

Optical encoders

12-13 bit absolute encoders

Optical Receivers

Controls/drives



Features

- Resistant to soldering processes, MSL2
- High uniformity of silicon cells (< 10%)
- Monolithic construction
- High temperature range
- Reference holes on the package for precise mounting
- Reference dots on the package for high accuracy mounting
- Reticle assembly service available

Pin Functions

No.	Name	Function
1	AE	Phototransistor A Emitter
2	CE	Phototransistor C Emitter
3	EE	Phototransistor E Emitter
4	HE	Phototransistor H Emitter
5	GE	Phototransistor G Emitter
6	KE	Phototransistor K Emitter
7	ME	Phototransistor M Emitter
8	OE	Phototransistor O Emitter
9	CC	Common collector
10	PE	Phototransistor P Emitter
11	NE	Phototransistor N Emitter
12	LE	Phototransistor L Emitter
13	IE	Phototransistor I Emitter
14	JE	Phototransistor J Emitter
15	FE	Phototransistor F Emitter
16	DE	Phototransistor D Emitter
17	BE	Phototransistor B Emitter
18	CC	Common collector

Ordering information

OIT7C	16-ch. phototransistor array 0.60mm optical pitch on plastic SMD package, cross shape, no encapsulant
-------	---

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

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		10	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		600		
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		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

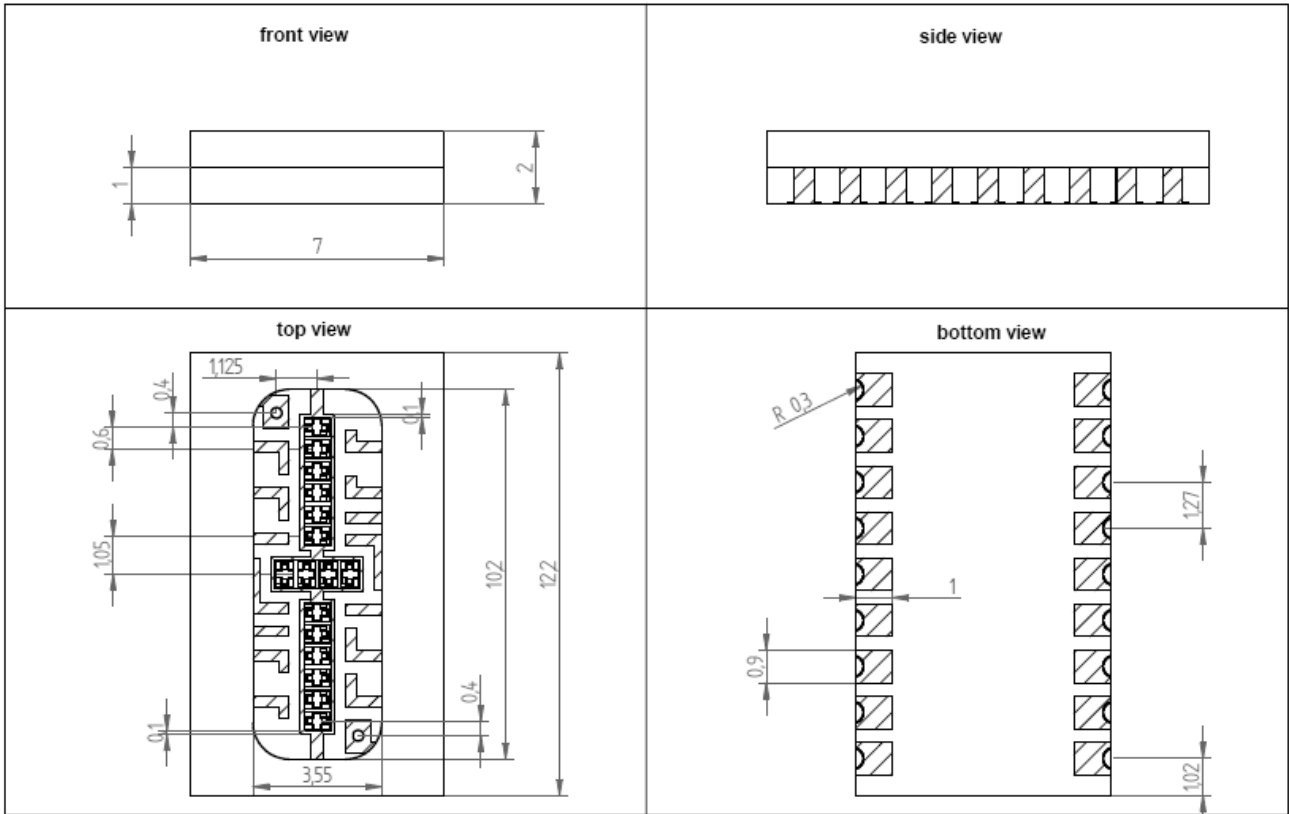
PACKAGE CHARACTERISTICS

Symbol	Parameter	Value	Unit
S _F	Pad Surface Finishing	GOLD	
S _L	Pad Shelf Life	6	months
MSL	Moisture Sensitive Level ‡	2	level

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

MECHANICAL DIMENSIONS

Units=mm Mechanical tolerance= ± 0.2 mm Die positioning tolerance= ± 0.030 mm



TYPICAL PERFORMANCE CURVES

Figure 1 – Output voltage Vs Temperature

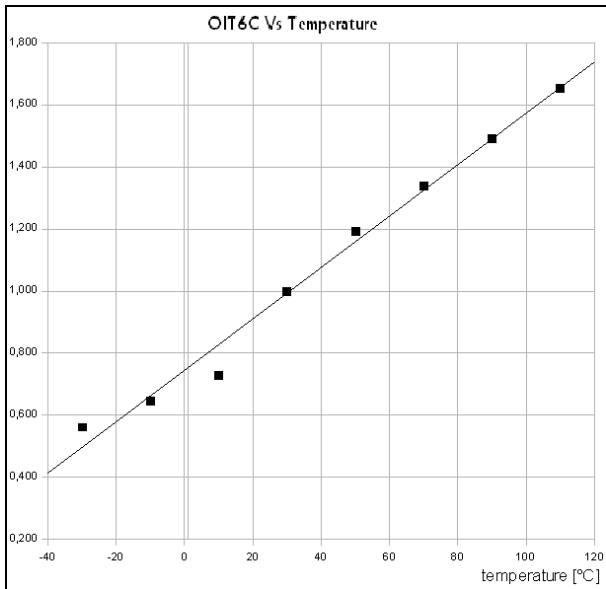


Figure 2 – Normalized spectral responsivity

