OIT2C-X

incremental encoder chip 0.6 mm

General Description

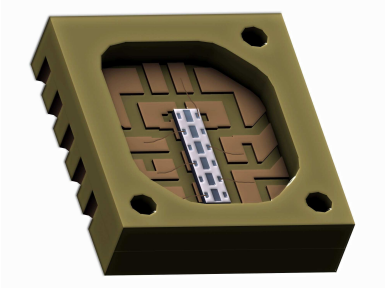
OIT2C-X consists in a silicon phototransistor's monolithic array.

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 encapsulant is an high quality microelectronic transparent resin, its transmission value is 100% in the range 300-900nm.

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 packaging method is oriented to industrial harsh applications, which means high temperature range, high stability in time and very high uniformity of the silicon cells.

The product is available with a number of elements ranging from 3 to 6.



Features

- **High uniformity**
- **High gain**
- **High transparency resin**
- **Designed to meet industrial specifications**
- **Reference holes for precise mounting**
- **Custom design available**
- **0.6 mm optical pitch (0.68 mm on request)**
- **RoHS compliant**

Applications

Optical encoders

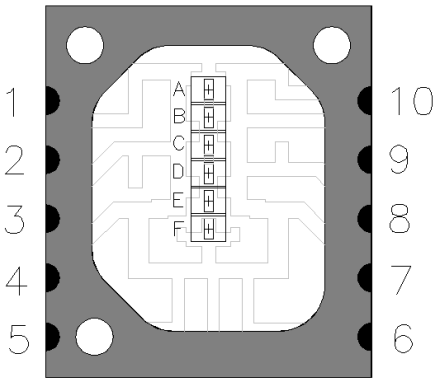
Incremental encoders

Optical Receivers

Controls/drives

Pin Functions

No.	Name	Function
1	CC	Common collector
2	BE	Phototransistor B Emitter
3	DE	Phototransistor D Emitter
4	N.C.	Not connected
5	FE	Phototransistor F Emitter
6	N.C.	Not connected
7	N.C.	Not connected
8	EE	Phototransistor E Emitter
9	CE	Phototransistor C Emitter
10	AE	Phototransistor A Emitter



TOP VIEW

Ordering Information

OIT2C-6	6 elements monolithic SMD phototransistor
OIT2C-5	5 elements monolithic SMD phototransistor
OIT2C-4	4 elements monolithic SMD phototransistor
OIT2C-3	3 elements monolithic SMD phototransistor

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Min	Max	Unit
T_A	Operating Temperature Range	-40	85	℃
T_S	Storage Temperature	-40	100	℃
T_{Sol}	Lead Temperature (solder) 3s		230	℃
$V_{R(BR)}$	Breakdown Voltage Collector-Emitter @ T_A=25℃ I_B=100nA I_C=1mA	50		V
P_D	Power Dissipation @ T_A=25℃		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℃ 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		600		
$V_{CE(sat)}$	Saturation Voltage	I_E=2mA I_B=20μA		150	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℃ unless otherwise noted.

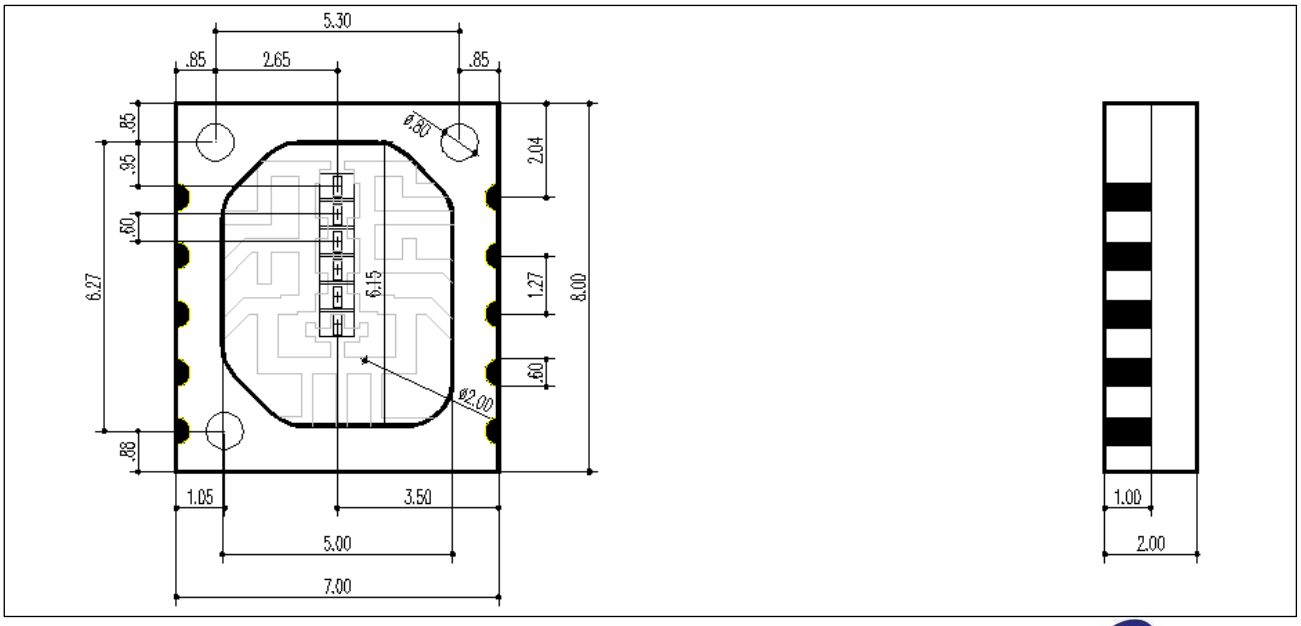
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
t_R	Rise Time	V_{CC}=5V I_C=1mA R_1=1kΩ		10		μs
t_F	Fall Time	V_{CC}=5V I_C=1mA R_1=1kΩ		11		μs

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

MECHANICAL DIMENSIONS

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



TYPICAL PERFORMANCE CURVES

Figure 1 – Output voltage Vs Temperature

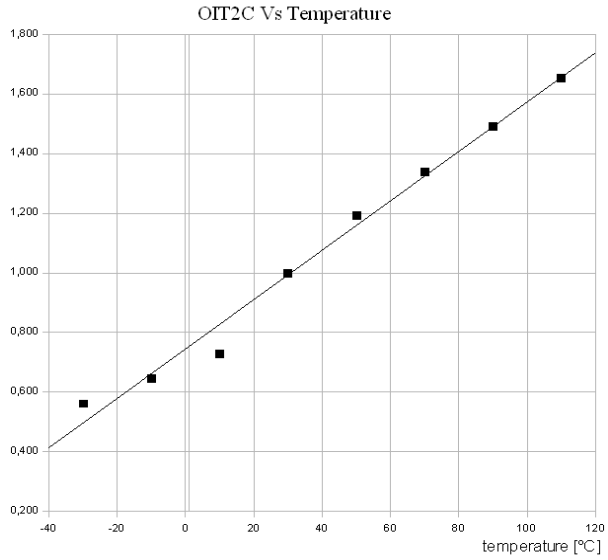


Figure 2 – Normalized spectral responsitivity