

## General Description

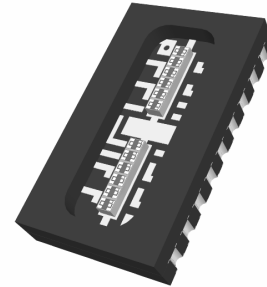
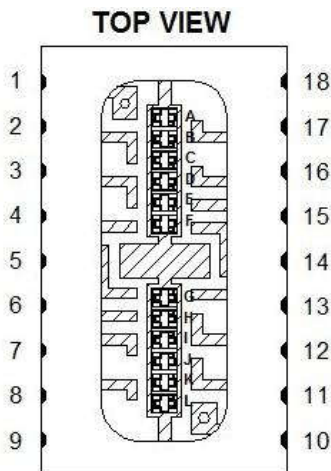
OIT6C consists in two silicon phototransistor's monolithic arrays. The phototransistors have a common collector on the back substrate, which is tied to two single pads and every emitter is accessible to specific pad. The optical pitch of the array is 0.60 mm, the LCC package electrical pitch is 1.27 mm. The active area of each element is 0.20 x 0.45 mm<sup>2</sup>.

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 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.

## Applications

Optical encoders  
 Incremental encoders  
 12 bit absolute encoders  
 Optical Receivers  
 Controls/drives



## Features

- High uniformity of silicon cells
- High transparency resin
- High gain
- Reference holes for precise mounting
- 0.6 mm optical pitch
- RoHS compliant

## Pin Functions

| No. | Name | Function                  |
|-----|------|---------------------------|
| 1   | AE   | Phototransistor A Emitter |
| 2   | CE   | Phototransistor C Emitter |
| 3   | EE   | Phototransistor E Emitter |
| 4   | N.C. | Not connected             |
| 5   | N.C. | Not connected             |
| 6   | GE   | Phototransistor G Emitter |
| 7   | IE   | Phototransistor I Emitter |
| 8   | KE   | Phototransistor K Emitter |
| 9   | CC   | Common collector          |
| 10  | LE   | Phototransistor L Emitter |
| 11  | JE   | Phototransistor J Emitter |
| 12  | HE   | Phototransistor H Emitter |
| 13  | N.C. | Not connected             |
| 14  | N.C. | Not connected             |
| 15  | FE   | Phototransistor F Emitter |
| 16  | DE   | Phototransistor D Emitter |
| 17  | BE   | Phototransistor B Emitter |
| 18  | CC   | Common collector          |

## Ordering Information

OIT6C 12-ch. phototransistor array 0.60mm optical pitch on plastic SMD package

## OIT6C

### ABSOLUTE MAXIMUM RATINGS

| Symbol             | Parameter  | Min | Max | Unit |
|--------------------|--|-----|-----|------|
| T <sub>A</sub>     | Operating Temperature Range  | -40 | 85  | °C   |
| T <sub>S</sub>     | Storage Temperature  | -40 | 85  | °C   |
| T <sub>Sol</sub>   | Lead Temperature (solder) 3s   |     | 230 | °C   |
| V <sub>R(BR)</sub> | Breakdown Voltage Collector-Emitter @ T <sub>A</sub> =25°C I <sub>B</sub> =100nA I <sub>C</sub> =1mA | 50  |     | V    |
| P <sub>D</sub>     | Power Dissipation @ T <sub>A</sub> =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<sub>A</sub> = 25°C unless otherwise noted.

| Symbol               | Parameter                  | Conditions  | Min | Typ  | Max  | Unit |
|----------------------|----------------------------|---|-----|------|------|------|
| I <sub>D</sub>       | Dark Current               | V <sub>R</sub> =10V                                       |     | 5    | 100  | nA   |
| R <sub>λ</sub>       | Responsivity               | V <sub>CE</sub> =5V λ=880nm                               | 0.5 |      |      | A/W  |
| λ <sub>p</sub>       | Peak Responsivity          | V <sub>CE</sub> =5V                                       |     | 750  |      | nm   |
| Δλ                   | Spectral Bandwidth @ 50%   | V <sub>CE</sub> =5V                                       | 500 |      | 950  | nm   |
| I <sub>ec0</sub>     | Emitter-Collector Current  | V <sub>CE</sub> =7.7V                                     |     | 0.1  | 100  | μA   |
| I <sub>ce0</sub>     | Collector-Emitter Current  | V <sub>CE</sub> =52V                                      |     | 0.1  | 100  | μA   |
| H <sub>FE</sub>      | Gain                       | V <sub>CC</sub> =5V I <sub>C</sub> =2mA                   | 500 | 1100 | 1500 |      |
| V <sub>CE(sat)</sub> | Saturation Voltage         | I <sub>E</sub> =2mA I <sub>B</sub> =20μA                  |     | 80   | 200  | mV   |
| I <sub>C(on)</sub>   | On-state Collector Current | V <sub>CE</sub> =5V E <sub>E</sub> =1.0mW/cm <sup>2</sup> |     | 1    |      | mA   |

### AC SWITCHING CHARACTERISTICS

T<sub>A</sub> = 25°C unless otherwise noted.

| Symbol         | Parameter | Conditions  | Min | Typ | Max | Unit |
|----------------|-----------|---|-----|-----|-----|------|
| t <sub>R</sub> | Rise Time | V <sub>CC</sub> =5V I <sub>C</sub> =1mA R <sub>1</sub> =1kΩ |     | 10  |     | μs   |
| t <sub>F</sub> | Fall Time | V <sub>CC</sub> =5V I <sub>C</sub> =1mA R <sub>1</sub> =1kΩ |     | 11  |     | μs   |

### MECHANICAL CHARACTERISTICS

| Symbol | Parameter                   | Conditions | Min | Typ  | Max | Unit            |
|--------|-----------------------------|------------|-----|------|-----|-----------------|
| A      | Phototransistor Active Area |            |     | 0.09 |     | mm <sup>2</sup> |
| L      | Length of the Active Area   |            |     | 0.2  |     | mm              |
| W      | Width of the Active Area    |            |     | 0.45 |     | mm              |

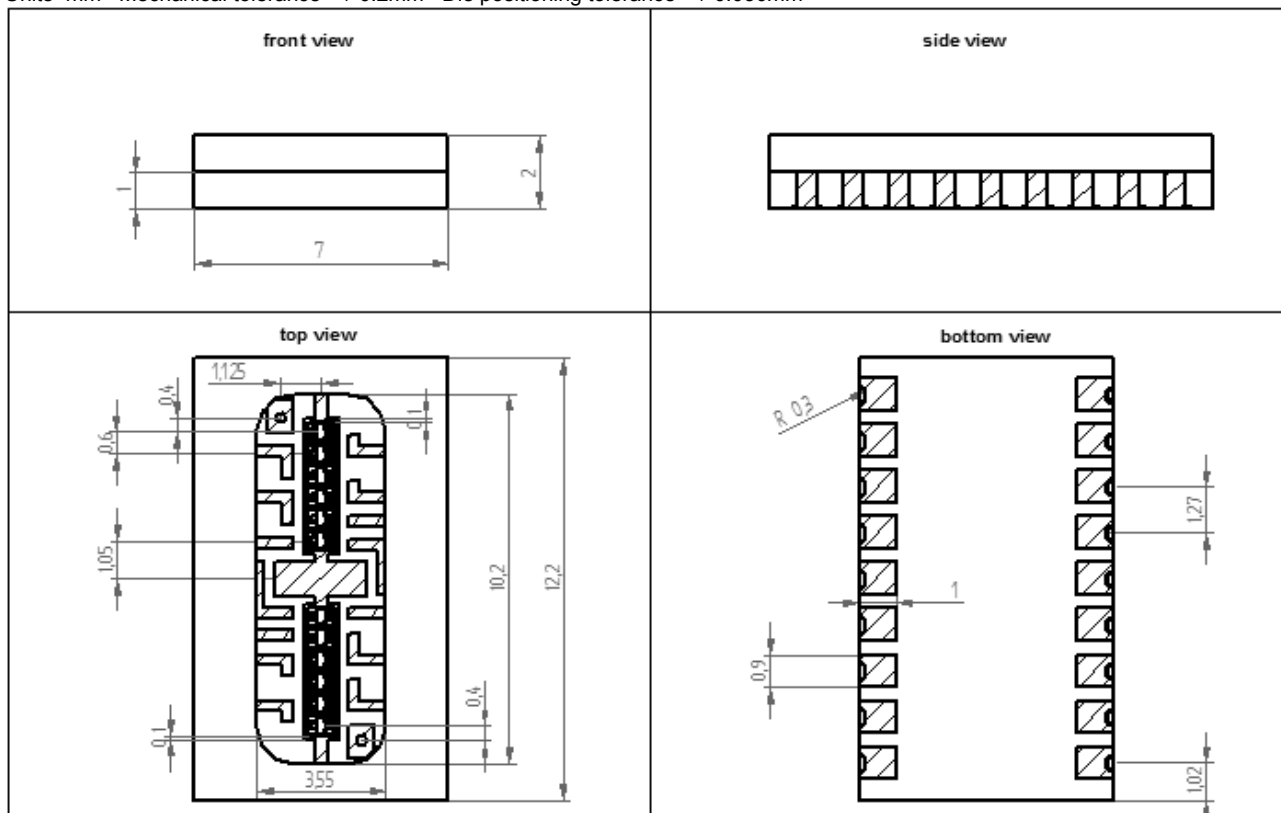
### PACKAGE CHARACTERISTICS

| Symbol         | Parameter                  | Value | Unit   |
|----------------|----------------------------|-------|--------|
| S <sub>F</sub> | Pad Surface Finishing      | GOLD  |        |
| S <sub>L</sub> | Pad Shelf Life             | 6     | months |
| MSL            | Moisture Sensitive Level † | 3     | level  |

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

**MECHANICAL DIMENSIONS**

Units=mm Mechanical tolerance= $\pm 0.2$ mm Die positioning tolerance= $\pm 0.030$ mm



**TYPICAL PERFORMANCE CURVES**

Figure 1 – Output voltage Vs Temperature

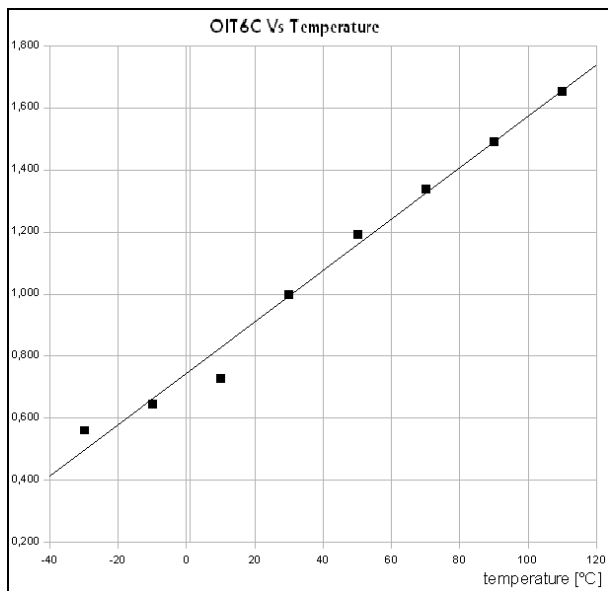


Figure 2 – Normalized spectral responsivity

