OIT29

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

General Description

OIT29 consists in a three elements 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 silicone resin: its transmission value is greater than 95% between 300nm and 400nm while it is very close to 100% in the range 400-900nm. The phototransistors have an antireflective coating that guarantees a good spectral bandwith (500-950nm) with a peak responsivity at 755nm. The main advantages of this device are the high uniformity of the silicon sensors in all elctro-optical parameters, due to the monolithic construction and the high optical responsivity, due to the antireflective coating deposited on the phototransistor's areas.

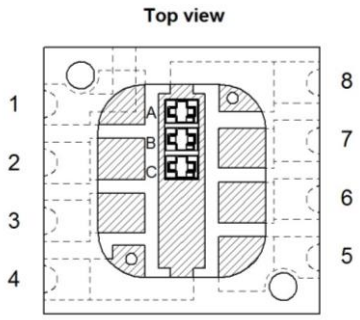
Applications

Optical encoders

Incremental encoders

Optical Receivers

Controls/drives



TOP VIEW

Features

- **High uniformity of silicon cells**
- **High transparency resin**
- **High gain**
- **Very small dimensions**
- **Reference dots on gold layer for very precise alignment**
- **Reference holes on frame for mechanical alignment**

Pin Functions

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

Ordering information

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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		360	°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=755nm	0.5			A/W
λ_p	Peak Responsivity	V_{CE}=5V		755		nm
$\Delta\lambda$	Spectral Bandwidth @ 50%	V_{CE}=5V	500		950	nm
I_{ec0}	Reverse Emitter to Collector Current	V_{EC}=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	1000	2000	-
$V_{CE(sat)}$	Saturation Voltage	I_E=2mA I_B=20µA		80	250	mV
$I_{C(on)}$	On-state Collector Current	V_{CE}=5V E_E=1.0mW/cm^2		1		mA
ΔI_c	Interchannel variation	V_{CE}=5V E_E=1.0mW/cm^2	-30		+30	%

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

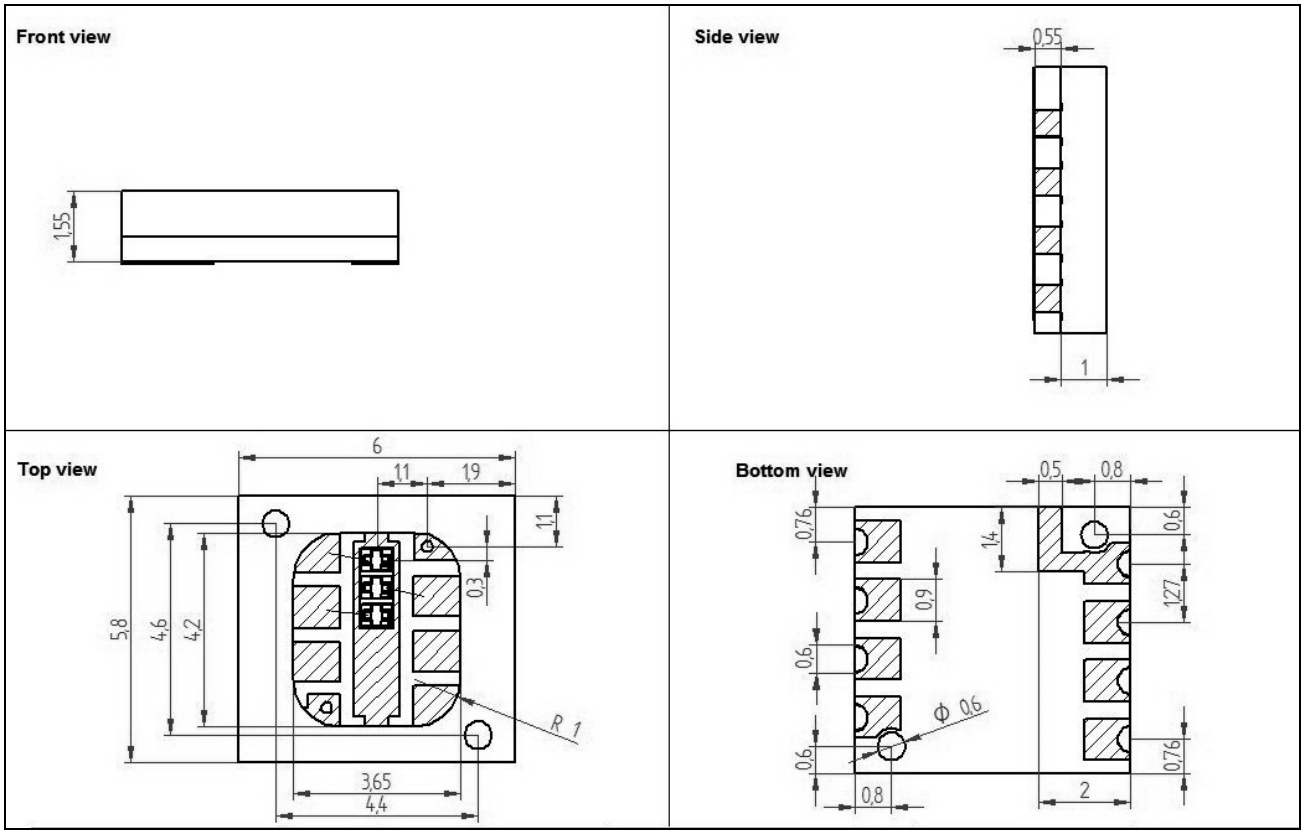
PACKAGE CHARACTERISTICS

Symbol	Parameter	Value	Unit
S_F	Pad Surface Finishing	GOLD	
S_L	Pad Shelf Life	6	months
MSL	Moisture Sensitive Level ‡ (see note at bottom page)	3	Level

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

MECHANICAL DIMENSIONS

Units=mm Mechanical tolerance=+/-0.2mm Die positioning tolerance=±0.050mm



TYPICAL PERFORMANCE CURVES

Figure 1 – Output voltage Vs Temperature

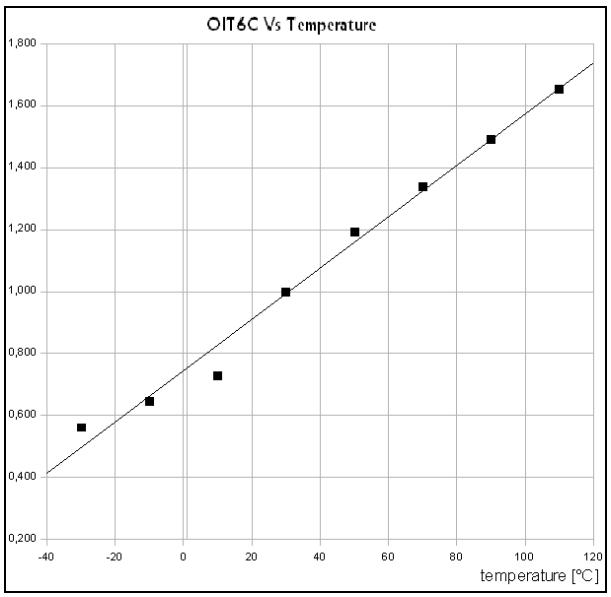


Figure 2 – Normalized spectral responsitivity