OIT20S04

MONOLITHIC 4 NPN PHOTRANSISTOR ARRAY

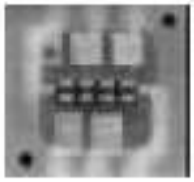
General Description

Optical device consisting of a monolithic 4 silicon NPN phototransistor array chip with high gain uniformity for the output signals.

The active area of each phototransistor is 0.2 x 0.45 mm^2.

The high optical responsivity is due to the antireflective coating deposited on the phototransistor active areas.

The package type is intended for direct mounting on ceramic or PC boards by manual soldering or SMT.



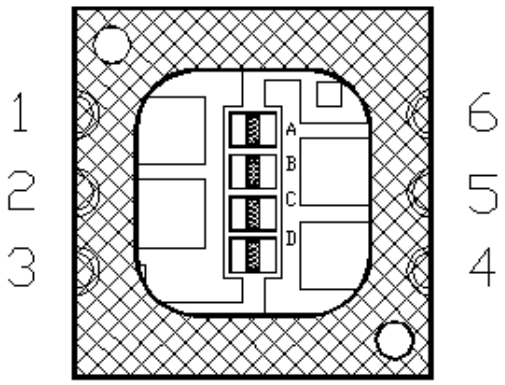
Applications

Incremental Encoders

4-bits Absolute Encoders

Features

- **High Gain Uniformity ±10%**
- **High Reliability**
- **Optical Pitch = 0.60 mm**
- **Available in 0.68 mm Optical Pitch Version**
- **Available in SMT Suitable Version**



Pin Functions

No.	Name	Function
1	AE	Phototransistor A Emitter
2	CE	Phototransistor C Emitter
3	CC	Common Collector
4	DE	Phototransistor D Emitter
5	BE	Phototransistor B Emitter
6	CC	Common Collector

Ordering Information

OIT20S04	Monolithic 4 Silicon NPN Phototransistor Array Chip with Active Area of Each Phototransistor 0.2 x 0.45 mm^2.

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Min	Max	Unit
T_A	Operating Temperature Range	-40	100	℃
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		10	100	nA
R_λ	Responsivity	V_{CE}=5V λ=880nm	0.5			A/W
λ_p	Peak Responsivity	V_{CE}=5V		900		nm
Δλ	Spectral Bandwidth @ 50%	V_{CE}=5V	600		1000	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		550		
$V_{CE(sat)}$	Saturation Voltage	I_E=2mA I_B=20μA		160	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