

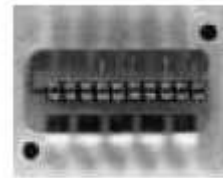
### General Description

Optical device consisting of a monolithic 10 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<sup>2</sup>.

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

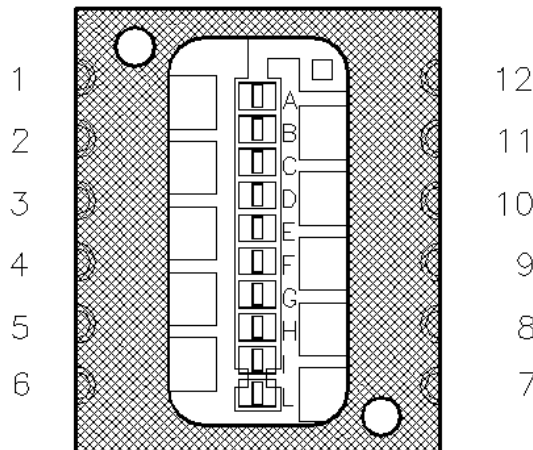
10-bits Absolute Encoders

General Purpose

### 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		N.C.
2	AE	Phototransistor A Emitter
3	CE	Phototransistor C Emitter
4	EE	Phototransistor E Emitter
5	GE	Phototransistor G Emitter
6	IE	Phototransistor I Emitter
7	LE	Phototransistor L Emitter
8	HE	Phototransistor H Emitter
9	FE	Phototransistor F Emitter
10	DE	Phototransistor D Emitter
11	BE	Phototransistor B Emitter
12	CC	Common Collector

### Ordering Information

**OIT20S10** Monolithic 10 Silicon NPN Phototransistor Array Chip with Active Area of Each Phototransistor 0.2 x 0.45 mm<sup>2</sup>.

# OIT20S10

## ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Min	Max	Unit
$T_A$	Operating Temperature Range	-40	100	°C
$T_S$	Storage Temperature	-40	100	°C
$T_{Sol}$	Lead Temperature (solder) 3s		230	°C
$V_{R(BR)}$	Breakdown Voltage Collector-Emitter @ $T_A=25^\circ\text{C}$ $I_B=100\text{nA}$ $I_C=1\text{mA}$	50		V
$P_D$	Power Dissipation @ $T_A=25^\circ\text{C}$		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

$T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_D$	Dark Current	$V_R=10\text{V}$		10	100	nA
$R_\lambda$	Responsivity	$V_{CE}=5\text{V}$ $\lambda=880\text{nm}$	0.5			A/W
$\lambda_p$	Peak Responsivity	$V_{CE}=5\text{V}$		900		nm
$\Delta\lambda$	Spectral Bandwidth @ 50%	$V_{CE}=5\text{V}$	600		1000	nm
$I_{ec0}$	Emitter-Collector Current	$V_{CE}=7.7\text{V}$		0.1	100	$\mu\text{A}$
$I_{ce0}$	Collector-Emitter Current	$V_{CE}=52\text{V}$		0.1	100	$\mu\text{A}$
$H_{FE}$	Gain	$V_{CC}=5\text{V}$ $I_C=2\text{mA}$		550		
$V_{CE(sat)}$	Saturation Voltage	$I_E=2\text{mA}$ $I_B=20\mu\text{A}$		160	200	mV
$I_{C(on)}$	On-state Collector Current	$V_{CE}=5\text{V}$ $E_E=1.0\text{mW/cm}^2$		1		mA

## AC SWITCHING CHARACTERISTICS

$T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$t_R$	Rise Time	$V_{CC}=5\text{V}$ $I_C=1\text{mA}$ $R_1=1\text{k}\Omega$		10		$\mu\text{s}$
$t_F$	Fall Time	$V_{CC}=5\text{V}$ $I_C=1\text{mA}$ $R_1=1\text{k}\Omega$		11		$\mu\text{s}$

## MECHANICAL CHARACTERISTICS

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
A	Phototransistor Active Area			0.09		$\text{mm}^2$
L	Length of the Active Area			0.2		mm
W	Width of the Active Area			0.45		mm

## MECHANICAL DIMENSIONS

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

