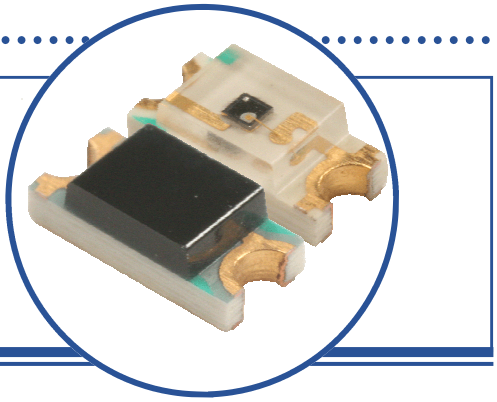
Silicon Photo Darlington in Miniature 1206 SMD Package

OP520DA, OP521DA

Features:

- High Photo Sensitivity
- Fast Response Time
- 1206 Package Size
- Opaque or Water Clear Flat Lens
- High Current Gain



Descriptions:

The **OP520DA** and **OP521DA** are NPN silicon photo darlingtons mounted in miniature 1206 SMD packages. Both the **OP520DA** and **OP521DA** have a flat lens however, the **OP520DA** lens are opaque to shield the device from ambient light unlike the lens of the **OP521DA**. These sensors are packaged in compact 1206 size chip carriers that are compatible with most automated mounting equipment. The **OP520DA** and **OP521DA** are mechanically and spectrally matched to the OP250 series infrared LEDs.

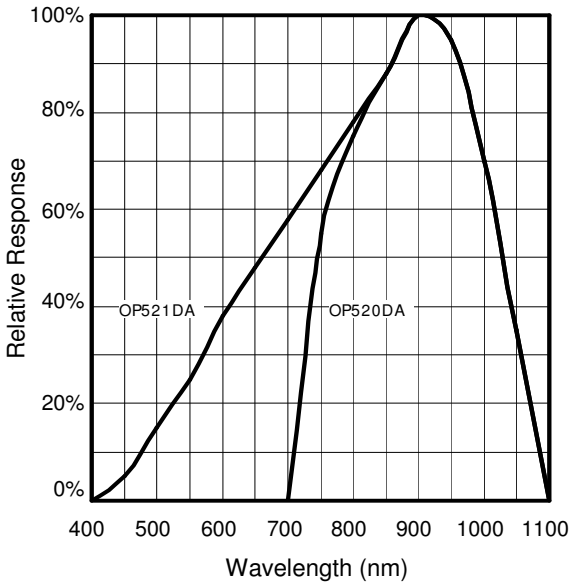
Since these devices have a flat window lens, they enable a wide acceptance angle. It is packaged in a plastic leadless chip carrier which is compatible for new applications with that need smaller dimension packages for automated mounting and detection equipment with new innovative designs. **OP520DA** and **OP521DA** are 100% production tested using infrared light for close correlation with Optek GaAs and GaAlAs emitters. Photo darlington devices are normally used in application where light signals are low and more current gain is needed than in comparison to the standard phototransistors.

Applications

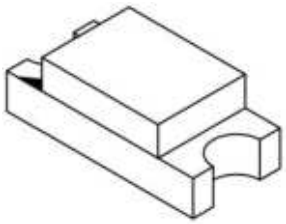
- Non-Contact Position Sensing
- Datum detection
- Machine automation
- Optical encoders

Ordering Information			
Part Number	**Sensor**	**Viewing Angle**	**Lead Length**
OP520DA	Photo Darlington	150°	N/A
OP521DA	Photo Darlington		

Relative Response vs. Wavelength



OP520DA, OP521DA



RoHS

Optek reserves the right to make changes at any time in order to improve design and to supply the best product possible.

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A subsidiary of
TT electronics plc

Silicon Photo Darlington in Miniature 1206 SMD Package
OP520DA, OP521DA

Absolute Maximum Ratings T_A = 25° C unless otherwise noted

Storage Temperature Range	-40° C to +100° C
Operating Temperature Range	-25° C to +85° C
Lead Soldering Temperature	260° C(1)
Collector-Emitter Voltage	35V
Emitter-Collector Voltage	5 V
Collector Current	30 mA
Power Dissipation	100 mW(2)

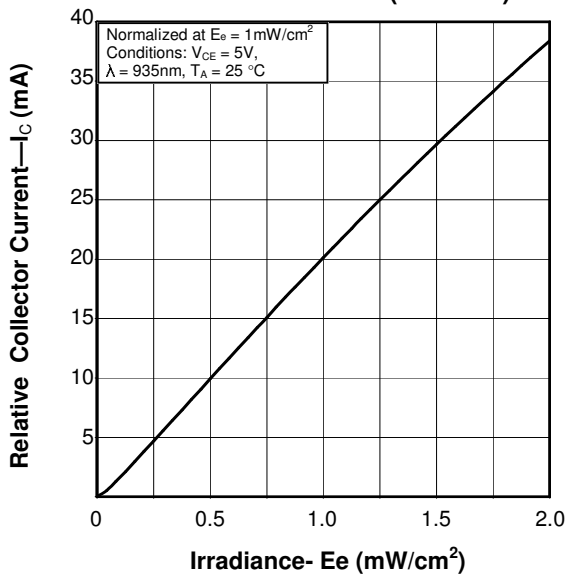
Notes:
1. Solder time less than 5 seconds at temperature extreme.
2. De-rate linearly at 2.17 mW/° C above 25° C.

Electrical Characteristics (T_A = 25°C unless otherwise noted)

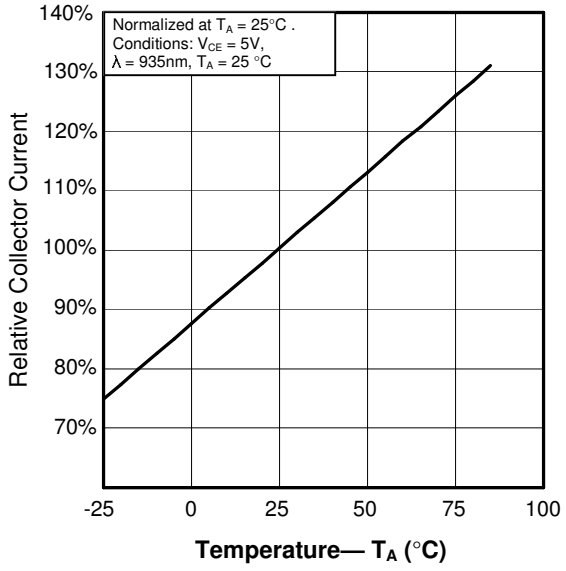
SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	CONDITIONS
$I_{C(ON)}$	On-State Collector Current	10.0			mA	V_{CE} = 5.0V, E_e = 0.5mW/cm^2 (3)
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage			1.7	V	I_C = 1mA, E_e = 5.0mW/cm^2 (3)
I_{CEO}	Collector-Emitter Dark Current			200	nA	V_{CE} = 5.0V, E_e = 0 (4)
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	35			V	I_C = 100µA, E_e = 0
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	5			V	I_E = 100µA, E_e = 0
λ	Spectral range of sensitivity OP521DA OP520DA	 400 700		 1100 1100	nm	V_{CE} = 5.0V
t_r, t_f	Rise and Fall Times		50		µs	I_C = 1mA, R_L = 1KΩ

3. Light source is an unfiltered GaAs LED with a peak emission wavelength of 935nm and a radiometric intensity level which varies less than 10% over the entire lens surface of the photo darlington being tested.
4. To Calculate typical collector dark current in µA, use the formula $I_{CEO} = 10^{(0.04\ T_A - 3/4)}$ where T_A is the ambient temperature in ° C.

Relative Collector Current-I_C (mA) vs. Irradiance-Ee (mW/cm^2)

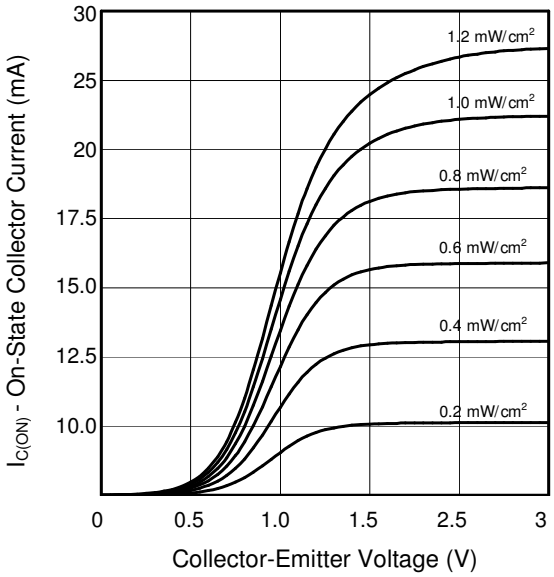


Relative On-State Collector Current vs. Temperature—(T_A)

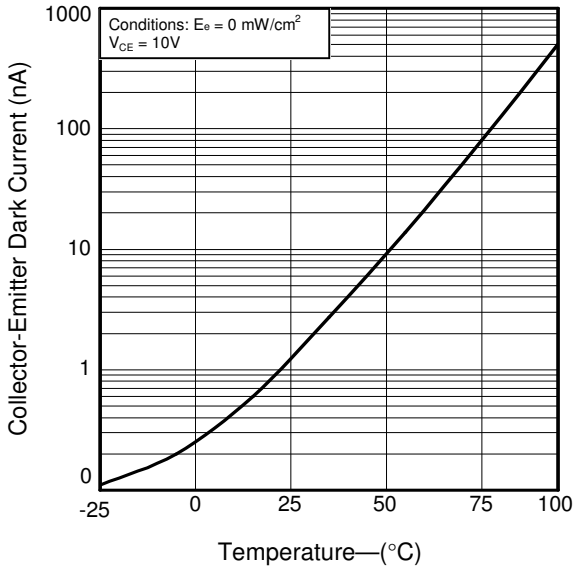


OP520DA, OP521DA

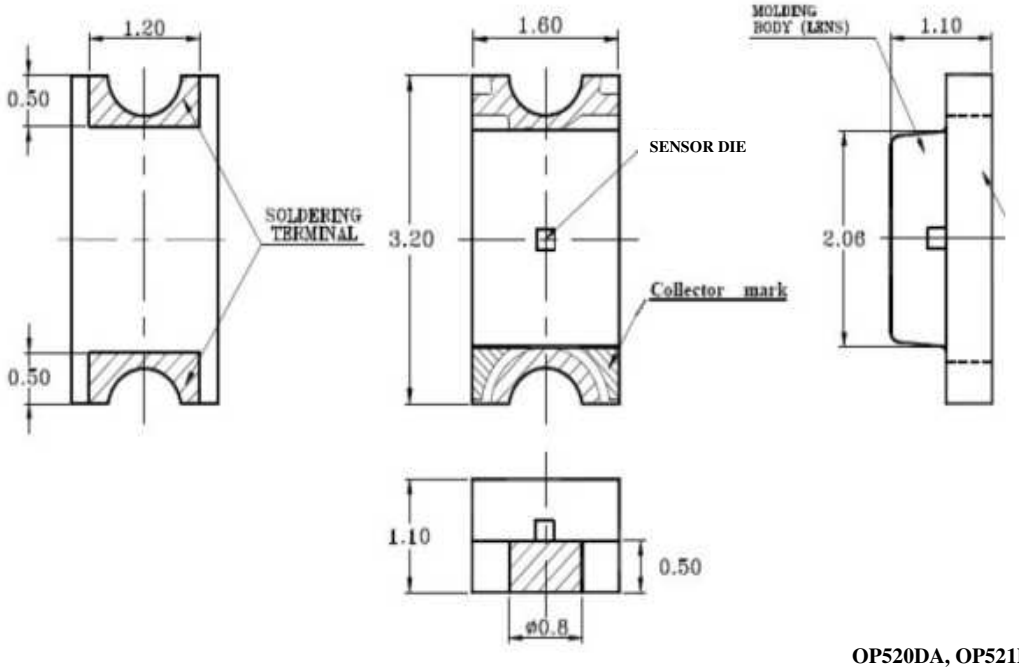
Relative On-State Collector Current vs. Collector-Emitter Voltage



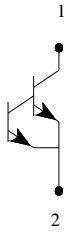
Collector-Emitter Dark Current vs. Temperature



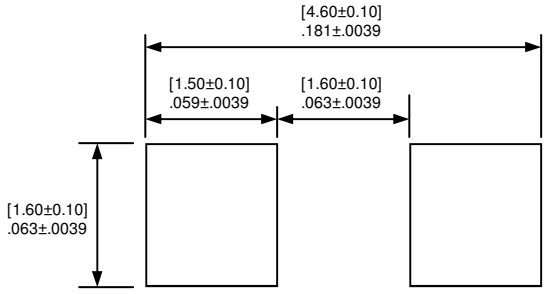
Package Dimensions



OP520DA, OP521DA



RECOMMENDED SOLDER PADS



PIN	FUNCTION
1	Collector
2	Emitter