Silicon Phototransistor and Photo Darlington in 1210 SMD Package

OP525, OP525DA

TT electronics
OPTEK Technology

Features:

- High Speed and High photo sensitivity
- Fast response time
- 1210 package size
- High Current Gain
- Water clear domed lens
- Narrrow Viewing Receiving Angle

OP525 and **OP525DA**

Description:

These devices consists of a NPN silicon phototransistor and photo darlington mounted in a miniature SMD package with a 1210 size chip carrier that is compatible with most automated mounting and position sensing equipment.

Both **OP525** and **OP525DA** have a 1.8mm domed lens. **OP525** and **OP525DA** have water clear lens that senses ambient light to higher wavelengths for applications from 450nm to 1120nm. Both devices have a narrow viewing acceptance angle (25°) and higher collector current gains due to the lenses on package.

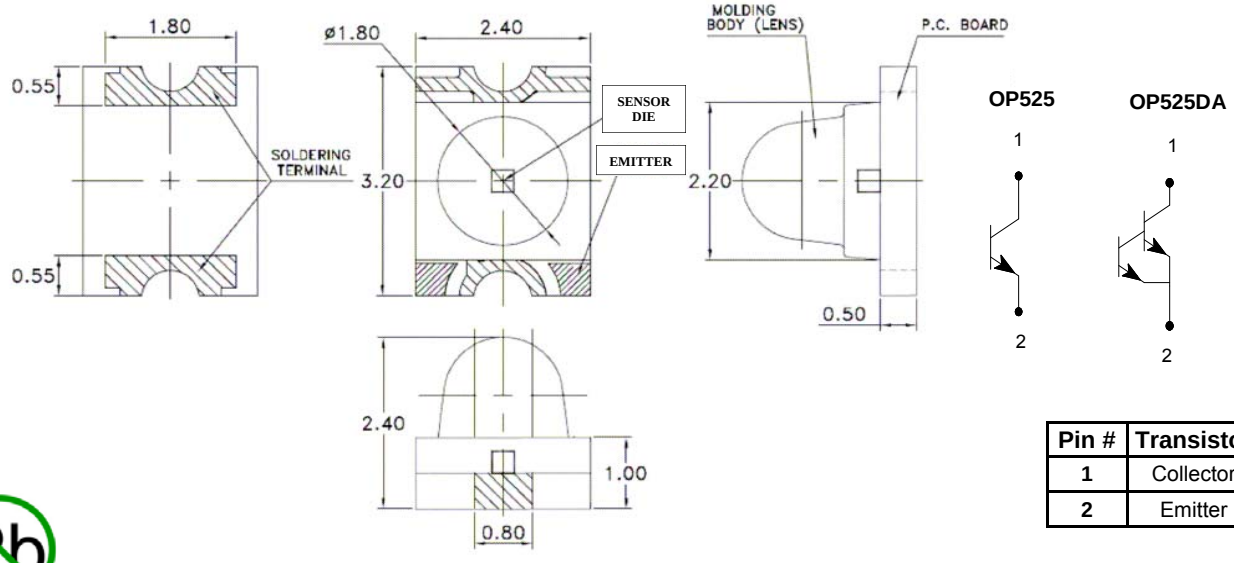
OP525 and **OP525DA** are devices that are 100% production tested using infrared light for close correlation with Optek GaAs and GaAlAs emitters. Photo darlington devices are normally used in application where light signals are low and more current gain is needed than is possible with phototransistors.

Applications:

- Non-contact position sensing
- Datum detection
- Machine automation
- Optical encoders

Ordering Information			
Part Number	**Sensor**	**Viewing Angle**	**Lead Length**
OP525	Phototransistor	25°	N/A
OP525DA	Photo Darlington		

OP525 and OP525DA



Pin #	Transistor
1	Collector
2	Emitter

DIMENSIONS ARE IN: [MILLIMETERS] INCHES

RoHS

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

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[1]	260° C
Collector-Emitter Voltage OP525 OP525DA	 30 V 35 V
Emitter-Collector Voltage	5 V
Collector Current OP525 OP525DA	 20 mA 30 mA
Power Dissipation[2] OP525 OP525DA	 75 mW 100 mW

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

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input Diode						
$I_{C(ON)}$	On-State Collector Current OP525 OP525DA	 1.0 10.0	 - -	 - -	mA	 V_{CE} = 5.0 V, E_E = 1.5 mW/cm^2 [3] V_{CE} = 5.0 V, E_E = 0.15 mW/cm^2 [3]
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage OP525 OP525DA	 - -	 - -	 0.3 1.7	V	 I_C = 100 µA, E_E = 1.0 mW/cm^2 [3] I_C = 1 mA, E_E = 0.5 mW/cm^2 [3]
I_{CEO}	Collector-Emitter Dark Current OP525 OP525DA	 -	 -	 100 200	nA	 V_{CC}= 10.0 V [4]
$V_{BR(CEO)}$	Collector-Emitter Breakdown Voltage	30 35	-	-	V	I_C= 100 µA, E_E = 0 I_C= 1 mA, E_E = 0
$V_{BR(ECO)}$	Emitter-Collector Breakdown Voltage OP525 OP525DA	 5 5	 - -	 - -	V	 I_E= 100 µA, E_E = 0 I_E= 100 µA, E_E = 0
t_r, t_f	Rise and Fall Times OP525 OP525DA	 -	 15 50	 - -	µs	 I_C= 1 mA, R_L = 1KΩ I_C= 1 mA, R_L = 1KΩ

Notes:
1. Solder time less than 5 seconds at temperature extreme.
2. Derate linearly at 1.33 mW/° C above 25° C.
3. Light source is an unfiltered GaAs LED with a peak emission wavelength of 935 nm and a radiometric intensity level which varies less than 10% over the entire lens surface of the phototransistor being tested.
4. To calculate typical collector dark current in µA, use the formulate $I_{CEO} = 10^{(0.04\,t\,-\,¾)}$, where T_A is the ambient temperature in ° C.

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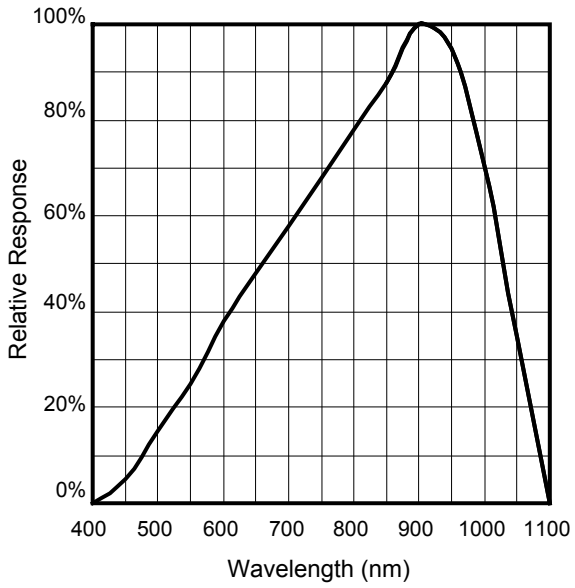
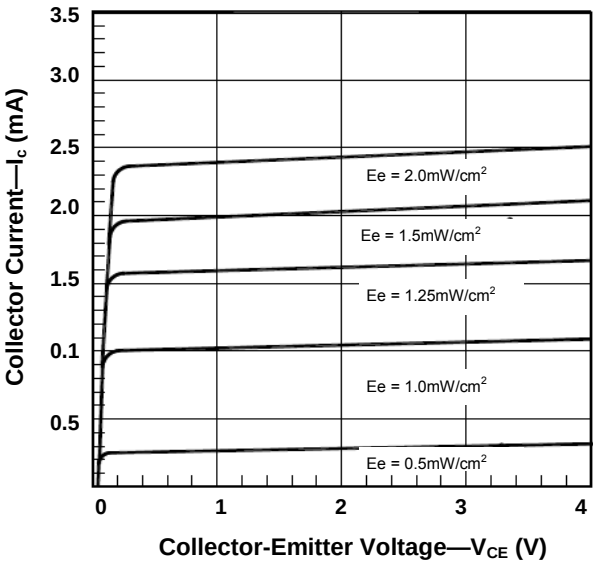
OP525 and OP525DA

Relative Response vs. Wavelength

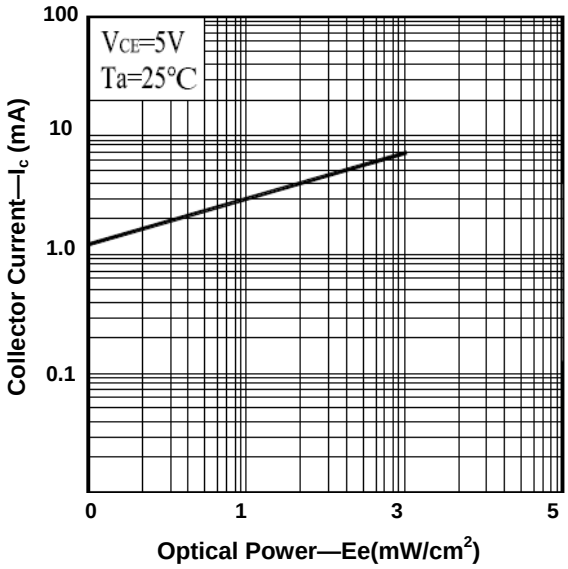


OP525

Collector Current—I_C (mA) vs Collector-Emiiter Voltage V_{CE} (V)



Collector Current—I_C (mA) vs Optical Power-Ee(mW/cm^2)



OP525DA

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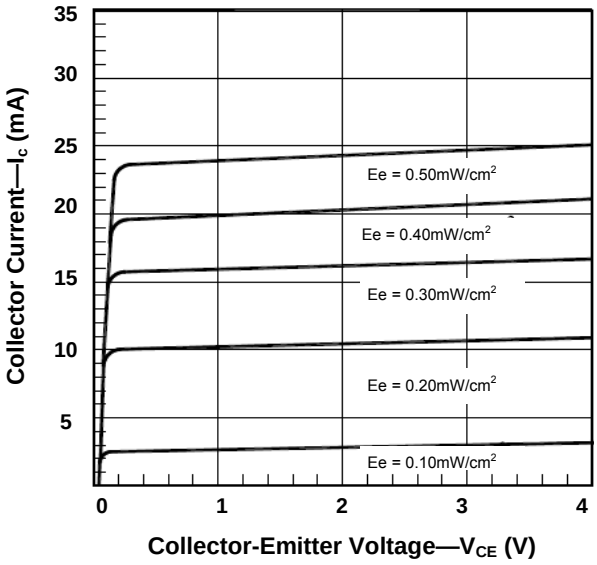
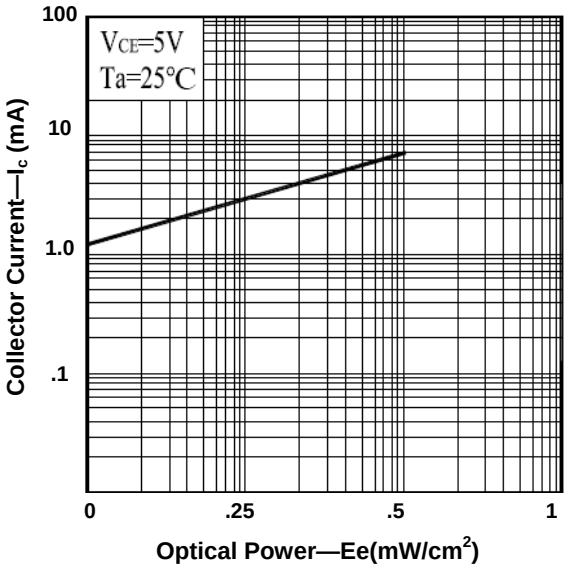


Collector Current—I_C (mA) vs Optical Power-Ee(mW/cm^2)



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