

NPN Silicon Phototransistors

OP515A, OP515B, OP515C, OP515D,
OP516A, OP516B, OP516C



Features:

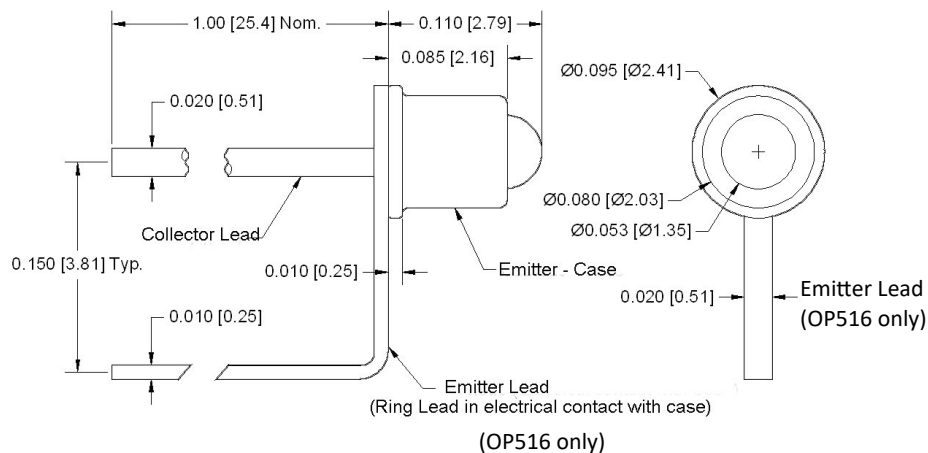
- Variety of sensitivity ranges
- Coaxial leaded package style
- Small package size for space limited applications



Description:

Each device in the OP515 and OP516 series consists of NPN silicon phototransistors in a small hermetic package with an extended Collector lead. The narrow receiving angle provides excellent on-axis coupling. This device is 100% production tested using infrared light for close correlation with Optek's GaAs and GaAlAs emitters.

Refer to Application Bulletin 202 for pill-type soldering to PC Board.



General Note

TT Electronics reserves the right to make changes in product specification without notice or liability. All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

© TT electronics plc

TT Electronics | OPTEK Technology
2900 E. Plano Pkwy, Plano, TX 75074 | Ph: +1 972 323 2200
www.ttelectronics.com | sensors@ttelectronics.com

Rev D 08/2025 Page 1

NPN Silicon Phototransistors

OP515A, OP515B, OP515C, OP515D,
OP516A, OP516B, OP516C



Electrical Specifications

Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Continuous Collector Current	50 mA
Collector-Emitter Voltage	30 V
Emitter-Collector Voltage (OP515 and OP516 series only)	5.0 V
Storage & Operating Temperature Range	-55 °C to + 125 °C
Lead Soldering Temperature (1/16 inch (1.6 mm) from case for 5 sec. with soldering iron) ⁽¹⁾	260 °C
Power Dissipation ⁽²⁾	100 mW

Notes:

- (1) RMA flux is recommended. Duration can be extended to 10 seconds max. when flow soldering. Maximum 20 grams when force may be applied to the leads when soldering.
- (2) Derate linearly 0.71 mW/°C above 25 °C.

Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
$I_{C(ON)}$ ⁽³⁾	On-State Collector Current OP515D OP515C/OP516C OP515B/OP516B OP515A/OP516A	0.40 1.00 3.00 6.00	- - - -	- - - -	mA	$V_{CE} = 5\text{ V}$, $E_e = 5.0\text{ mW/cm}^2$
I_{CEO} ⁽⁴⁾	Collector-Dark Current	-	-	100	nA	$V_{CE} = 10\text{ V}$, $E_e = 0$
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	30	-	-	V	$I_C = 100\text{ }\mu\text{A}$
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	5	-	-	V	$I_E = 100\text{ }\mu\text{A}$
$V_{CE(SAT)}$ ⁽³⁾	Collector-Emitter Saturation Voltage OP515/OP516	-	-	0.40	V	$I_C = 400\text{ }\mu\text{A}$, $E_e = 5.0\text{ mW/cm}^2$
$\Delta I_C/\Delta T$	Relative I_C Changes with Temperature OP515A-D and OP516A-C series	-	1.00	-	%/°C	$V_{CE} = 5\text{ V}$, $E_e = 1.0\text{ mW/cm}^2$
I_{ECO}	Emitter-Reverse Current	-	-	100	μA	$V_{EC} = 0.4\text{ V}$

Notes:

- (1) $E_{e(APT)}$ is a measurement of the average apertured radiant energy incident upon a sensing area 0.250" (6.35 mm) in diameter and perpendicular to and centered to the mechanical axis of the emitting surface at a distance of 0.466" (11.84 mm). $E_{e(APT)}$ is not necessarily uniform within the measured area.
- (2) Derating linearly 0.71 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 nA, use the formula $I_{CEO} = 10^{(0.040T_A - 3.4)}$ where T_A is ambient temperature in °C.

General Note

TT Electronics reserves the right to make changes in product specification without notice or liability. All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

TT Electronics | OPTEK Technology
2900 E. Plano Pkwy, Plano, TX 75074 | Ph: +1 972 323 2200
www.ttelectronics.com | sensors@ttelectronics.com

Rev D 08/2025 Page 2

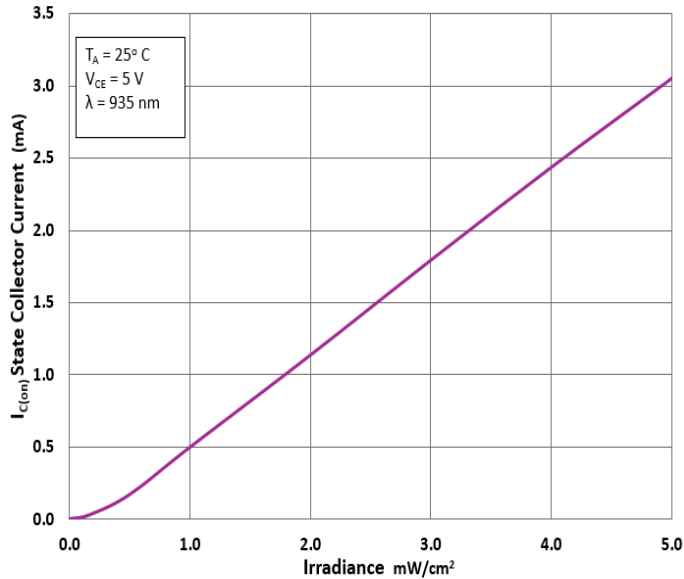
NPN Silicon Phototransistors

OP515A, OP515B, OP515C, OP515D,
OP516A, OP516B, OP516C

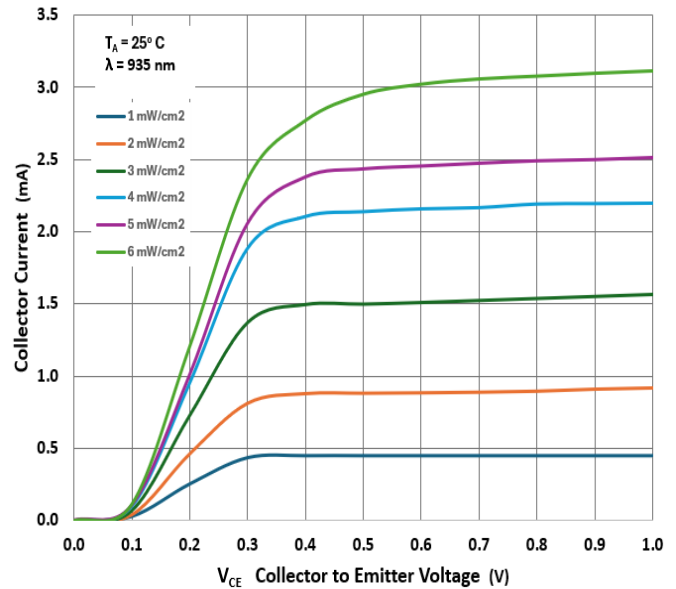


Typical Performance

On-State Collector Current vs Irradiance



Collector Current vs Collector to Emitter Voltage



General Note

TT Electronics reserves the right to make changes in product specification without notice or liability. All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

© TT electronics plc

TT Electronics | OPTEK Technology
2900 E. Plano Pkwy, Plano, TX 75074 | Ph: +1 972 323 2200
www.ttelectronics.com | sensors@ttelectronics.com

Rev D 08/2025 Page 3