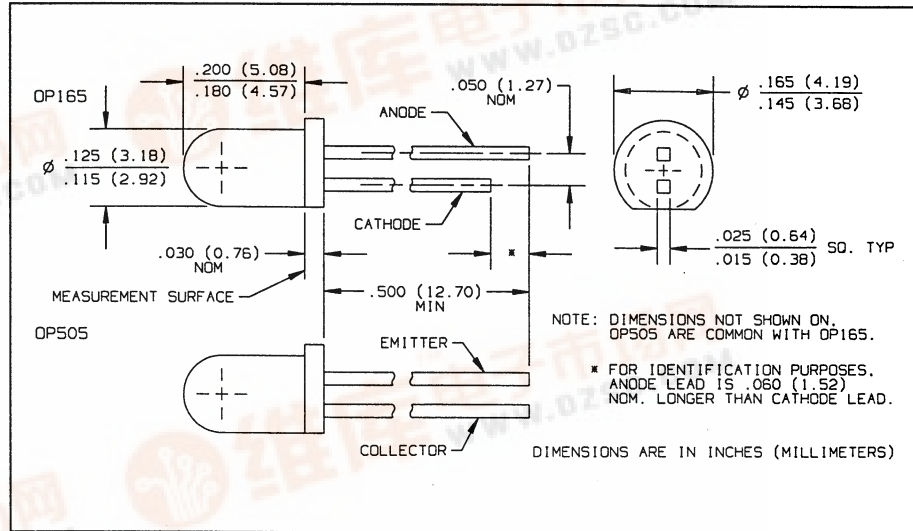
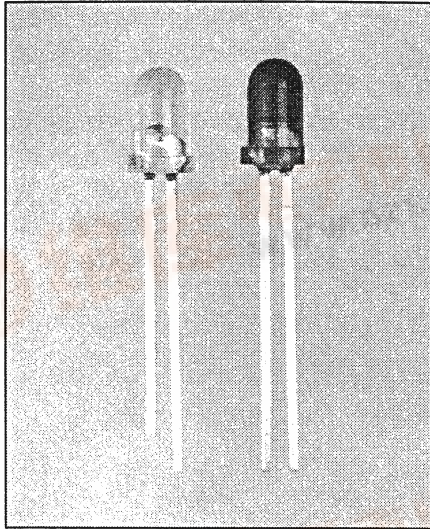


Product Bulletin OPS665
July 1996

LED and Photosensor Pair

Types OPS665, OPS666, OPS667



Features

- T-1 package style
- High current transfer ratio
- Low cost plastic package
- Three current range selections

Description

The OPS665 through OPS667 each consist of a gallium arsenide infrared emitting diode (OP165) and an NPN silicon phototransistor (OP505) mounted in matched plastic T-1 packages. Matched pairs are desirable where the application is unique and the quantity required does not justify assembly tooling costs. The units are offered in three different sensitivity ranges to give the designer more flexibility. If separation between the LED and sensor is greater than two times the specified $I_C(ON)$ distance, proper alignment becomes critical. It should be remembered that the sensor is sensitive to ambient light. Although sold as pairs, emitters are packaged separately from sensors for ease of handling.

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

Storage and Operating Temperature $-40^\circ C$ to $+100^\circ C$
Lead Soldering Temperature [1/16 inch (1.6 mm) from case for 5 sec. with soldering iron] $260^\circ C^{(1)}$

Input Diode

Continuous Forward Current 50 mA
Peak Forward Current (1 μs pulse width, 300 pps) 3.0 A
Reverse Voltage 2.0 V
Power Dissipation $100 mW^{(2)}$

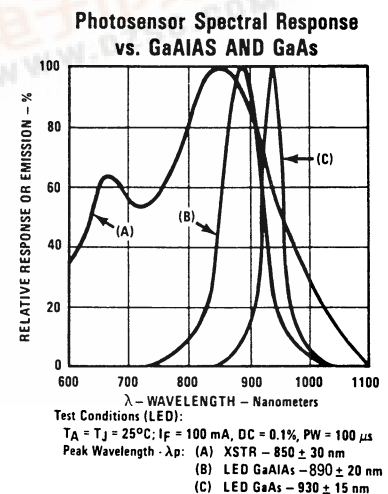
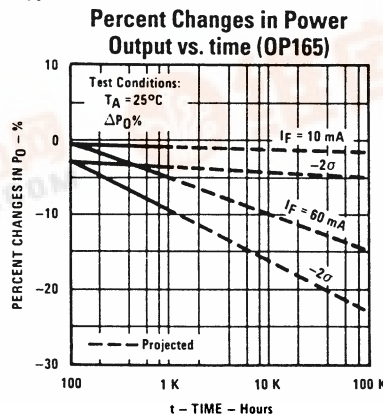
Output Photosensor

Collector-Emitter Voltage 30 V
Emitter-Collector Voltage 5.0 V
Power Dissipation $100 mW^{(2)}$

Notes:

- (1) RMA flux is recommended. Duration can be extended to 10 sec. max when flow soldering. Max. 20 grams force may be applied to leads when soldering.
- (2) Derate linearly $1.33 mW/^\circ C$ above $25^\circ C$.

Typical Performance Curves



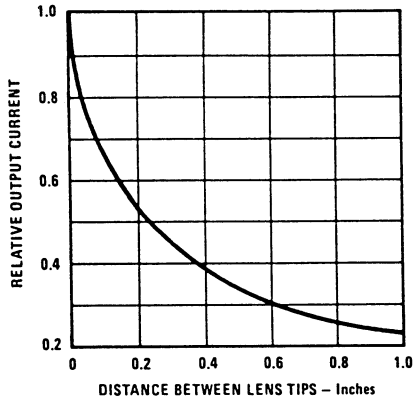
Types OPS665, OPS666, OPS667

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

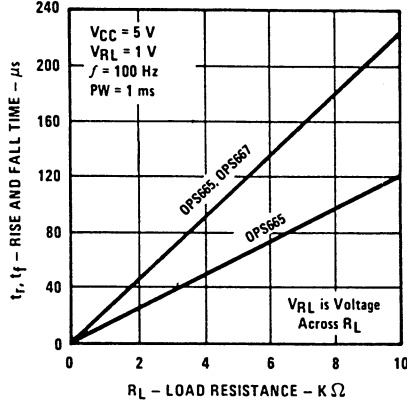
SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input Diode						
V_F	Forward Voltage			1.60	V	$I_F = 20\text{ mA}$
I_R	Reverse Current			100	μA	$V_R = 2.0\text{ V}$
Output Photosensor						
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	30			V	$I_C = 100\ \mu\text{A}$
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	5.0			V	$I_E = 100\ \mu\text{A}$
I_{CEO}	Collector Dark Current			100	nA	$V_{CE} = 15\text{ V}, E_e = 0$
$I_{C(ON)}$	On-State Collector Current	OPS665 OPS666 OPS667	0.5 1.0 5.0		mA mA mA	$V_{CE} = 5\text{ V}, I_F = 20\text{ mA}$ $d = 0.25''$ lens tip to lens tip

Typical Performance Curves

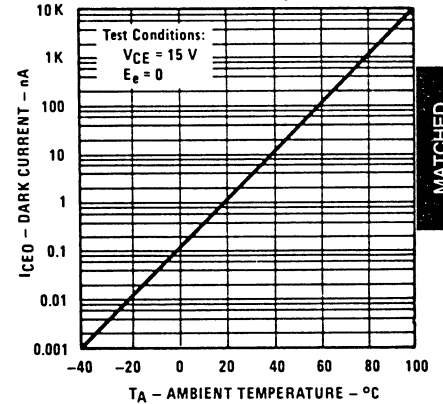
Coupling Characteristics of OP165 and OP505



Rise and Fall Time vs. Load Resistance

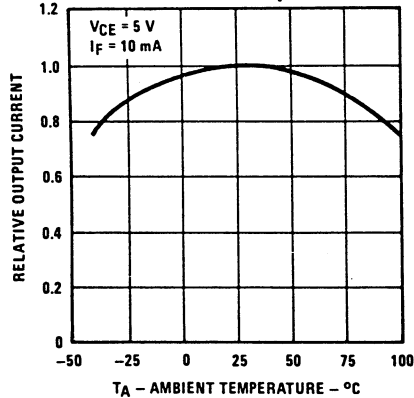


Collector Dark Current vs. Ambient Temperature

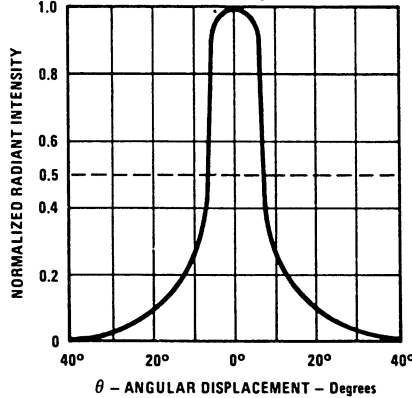


MATCHED PAIRS

Coupled-Relative Output Collector Current vs. Ambient Temperature



Emission (LED) and Response (Sensor) Normalized Radiant Intensity vs. Angular Displacement



Relative Power Output vs. Forward Current (LED)

