

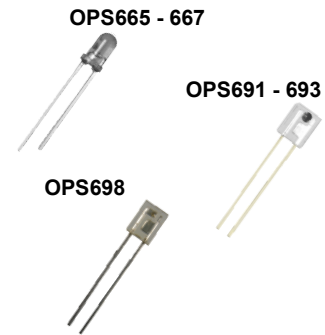
# LED and Photosensor Pairs

OPS665, OPS666, OPS667, OPS691, OPS692, OPS693, OPS698



## Features:

- High current transfer ratio
- Low-cost plastic package
- Lateral side-looking clear plastic package (OPS691, OPS692, OPS693 and OPS698)



## Description:

Each LED/Photosensor pair in the series consists of a gallium arsenide infrared emitting diode and a NPN silicon phototransistor, mounted in a T-1 package (**OPS665, OPS666, OPS667**) or in a matched lateral side-looking plastic package (**OPS691, OPS692, OPS693 and OPS698**).

Matched pairs are desirable where the application is unique and the quantity required does not justify assembly tooling costs. If separation between the LED and sensor is greater than two times the specified  $IC_{(ON)}$  distance, proper alignment becomes critical. Although sold as pairs, emitters and sensors are packaged separately for handling ease.

Please note that the sensor is sensitive to ambient light.

## Applications:

- Non-contact reflective object sensor
- Assembly line automation
- Machine automation
- Machine safety
- End of travel sensor
- Door sensor

| Ordering Information |            |                         |                                                                                         |                  |
|----------------------|------------|-------------------------|-----------------------------------------------------------------------------------------|------------------|
| Part Number          | Output     | Package Style           | Description                                                                             | Lead Length      |
| OPS665               | Transistor | T-1                     | Gallium arsenide infrared emitting diode (OP165)<br>NPN silicon phototransistor (OP505) | 0.50" (1.700 mm) |
| OPS666               | Transistor | T-1                     | Gallium arsenide infrared emitting diode (OP165)<br>NPN silicon phototransistor (OP505) | 0.50" (1.700 mm) |
| OPS667               | Transistor | T-1                     | Gallium arsenide infrared emitting diode (OP165)<br>NPN silicon phototransistor (OP505) | 0.50" (1.700 mm) |
| OPS691               | Transistor | Lateral<br>Side-looking | Gallium arsenide infrared emitting diode (OP140)<br>NPN silicon phototransistor (OP550) | 0.50" (1.700 mm) |
| OPS692               | Transistor | Lateral<br>Side-looking | Gallium arsenide infrared emitting diode (OP140)<br>NPN silicon phototransistor (OP550) | 0.50" (1.700 mm) |
| OPS693               | Transistor | Lateral<br>Side-looking | Gallium arsenide infrared emitting diode (OP140)<br>NPN silicon phototransistor (OP550) | 0.50" (1.700 mm) |
| OPS698               | Transistor | Lateral<br>Side-looking | Gallium arsenide infrared emitting diode (OP145)<br>NPN silicon phototransistor (OP555) | 0.50" (1.700 mm) |



## General Note

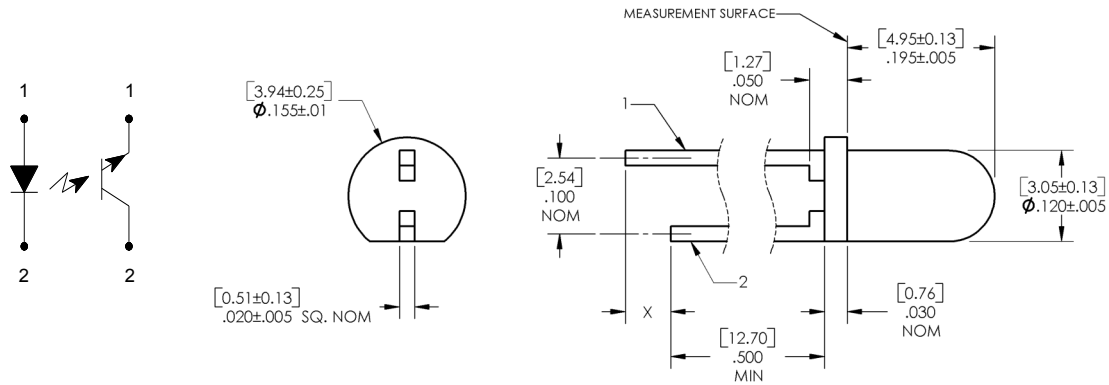
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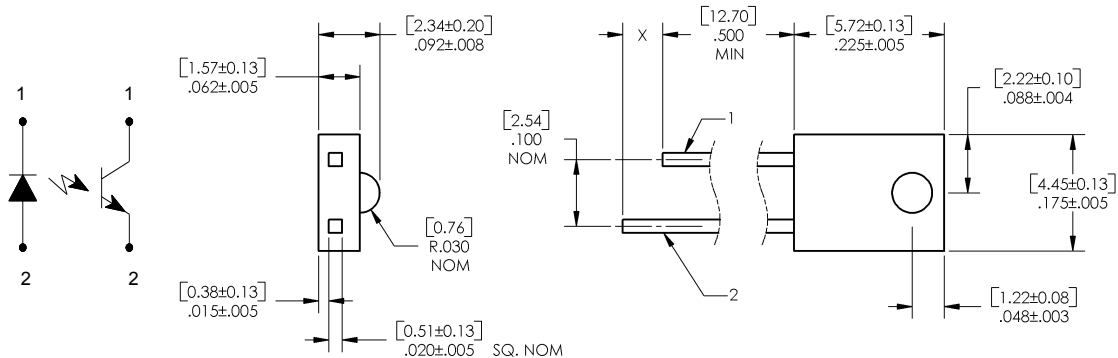
## OPS665, OPS666, OPS667



DIMENSIONS ARE IN INCHES AND [MILLIMETERS].

| Pin # | LED & Diode<br>X=0.060" (1.5) | Transistor<br>X=0" (0.0 mm) |
|-------|-------------------------------|-----------------------------|
| 1     | Anode                         | Emitter                     |
| 2     | Cathode                       | Collector                   |

## OPS691, OPS692, OPS693



DIMENSIONS ARE IN INCHES AND [MILLIMETERS].

| Pin # | LED<br>X=0.060" (1.5) | Sensor<br>X=0" (0.0 mm) |
|-------|-----------------------|-------------------------|
| 1     | Cathode               | Emitter/Anode           |
| 2     | Anode                 | Collector/Cathode       |

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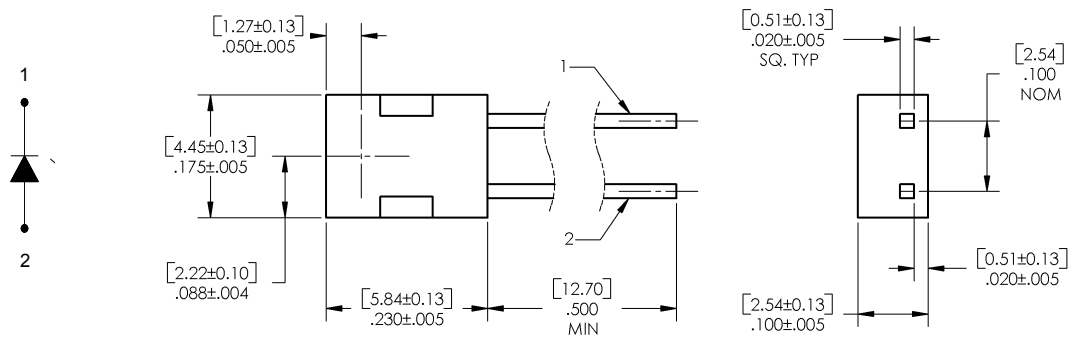
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# LED and Photosensor Pairs

OPS665, OPS666, OPS667, OPS691, OPS692,  
OPS693, OPS698



## OPS698



DIMENSIONS ARE IN INCHES AND [MILLIMETERS].

| Pin # | Diode   |
|-------|---------|
| 1     | Cathode |
| 2     | Anode   |

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# LED and Photosensor Pairs

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OPS693, OPS698



## Electrical Specifications

| Absolute Maximum Ratings ( $T_A = 25^\circ\text{C}$ unless otherwise noted)                 |                                             |
|---------------------------------------------------------------------------------------------|---------------------------------------------|
| Storage & Operating Temperature Range                                                       | $-40^\circ\text{C}$ to $+100^\circ\text{C}$ |
| Lead Soldering Temperature [1/16 inch (1.6mm) from the case for 5 sec. with soldering iron] | $260^\circ\text{C}^{(1)}$                   |
| <b>Input Diode</b>                                                                          |                                             |
| Forward DC Current                                                                          | 50 mA                                       |
| Peak Forward Current (1 $\mu\text{s}$ pulse width, 300 pps)                                 | 3.0 A                                       |
| Reverse DC Voltage                                                                          | 2.0 V                                       |
| Power Dissipation                                                                           | 100 mW <sup>(2)</sup>                       |
| <b>Output Photosensor (OPS665/666/667) or Output Phototransistor (691/692/693/698)</b>      |                                             |
| Collector-Emitter Voltage                                                                   | 30 V                                        |
| Emitter-Collector Voltage                                                                   | 5 V                                         |
| Power Dissipation                                                                           | 100 mW <sup>(2)</sup>                       |

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OPS693, OPS698



## Electrical Specifications

| Electrical Characteristics ( $T_A = 25^\circ\text{C}$ unless otherwise noted) |                                      |     |     |     |               |                                                            |
|-------------------------------------------------------------------------------|--------------------------------------|-----|-----|-----|---------------|------------------------------------------------------------|
| SYMBOL                                                                        | PARAMETER                            | MIN | TYP | MAX | UNITS         | TEST CONDITIONS                                            |
| <b>Input Diode</b>                                                            |                                      |     |     |     |               |                                                            |
| $V_F$                                                                         | Forward Voltage                      | -   | -   | 1.6 | V             | $I_F = 20\text{ mA}$                                       |
| $I_R$                                                                         | Reverse Current                      | -   | -   | 100 | $\mu\text{A}$ | $V_R = 2\text{ V}$                                         |
| <b>Output Phototransistor</b>                                                 |                                      |     |     |     |               |                                                            |
| $V_{(BR)CEO}$                                                                 | Collector-Emitter Breakdown Voltage  | 30  | -   | -   | V             | $I_C = 100\text{ }\mu\text{A}$ , $E_E = 0$                 |
| $V_{(BR)ECO}$                                                                 | Emitter-Collector Breakdown Voltage  | 5.0 | -   | -   | V             | $I_E = 100\text{ }\mu\text{A}$ , $E_E = 0$                 |
| $I_{CEO}$                                                                     | Collector-Emitter Dark Current       | -   | -   | 100 | nA            | $V_{CE} = 15\text{ V}$ , $I_F = 0$ , $I_E = 0$             |
|                                                                               | OPS665/666/667                       | -   | -   | 100 | nA            | $V_{CE} = 10\text{ V}$ , $I_F = 0$ , $I_E = 0$             |
|                                                                               | OPS691/692/693                       | -   | -   | 100 | nA            | $V_{CE} = 10\text{ V}$ , $I_F = 0$ , $I_E = 0$             |
|                                                                               | OPS698                               | -   | -   | 100 | nA            | $V_{CE} = 10\text{ V}$ , $I_F = 0$ , $I_E = 0$             |
| <b>Combined</b>                                                               |                                      |     |     |     |               |                                                            |
| $V_{CE(SAT)}$                                                                 | Collector-Emitter Saturation Voltage | -   | -   | -   | -             | -                                                          |
|                                                                               | OPS665/666/667                       | -   | -   | 0.4 | V             | $I_F = 20\text{ mA}$ , $I_C = 50\text{ }\mu\text{A}^{(3)}$ |
|                                                                               | OPS691/692/693<br>OPB698             | -   | -   | 0.4 | V             | $I_F = 20\text{ mA}$ , $I_C = 50\text{ }\mu\text{A}^{(3)}$ |
| $I_{C(ON)}$                                                                   | On-State Collector Current           |     |     |     |               |                                                            |
|                                                                               | OPS665                               | 0.5 | -   | -   | mA            | $V_{CE} = 5\text{ V}$ , $I_F = 20\text{ mA}^{(3)}$         |
|                                                                               | OPS666                               | 1.0 | -   | -   | mA            |                                                            |
|                                                                               | OPS667                               | 5.0 | -   | -   | mA            |                                                            |
|                                                                               | OPS691                               | 500 | -   | -   | $\mu\text{A}$ | $V_{CE} = 10\text{ V}$ , $I_F = 20\text{ mA}^{(3)}$        |
|                                                                               | OPS692                               | 1.0 | -   | -   | mA            |                                                            |
|                                                                               | OPS693, OPS698                       | 2.0 | -   | -   | mA            |                                                            |

### Notes:

- (1) RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering.
- (2) Derate linearly  $1.33\text{ mW}/^\circ\text{C}$  above  $25^\circ\text{C}$ .
- (3) Distance from lens tip to lens tip is  $0.250''$  (6.35 mm) - OPS665, OPS666, OPS667  
Distance from lens tip to lens tip is  $0.125''$  (3.175 mm) - OPS691 thru OPS698

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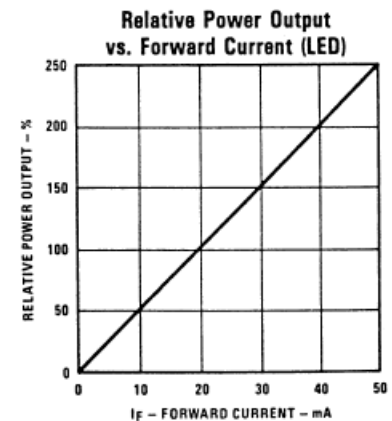
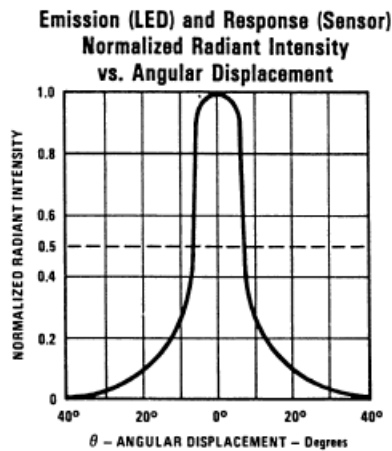
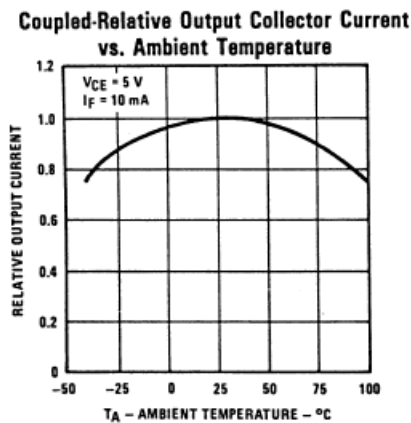
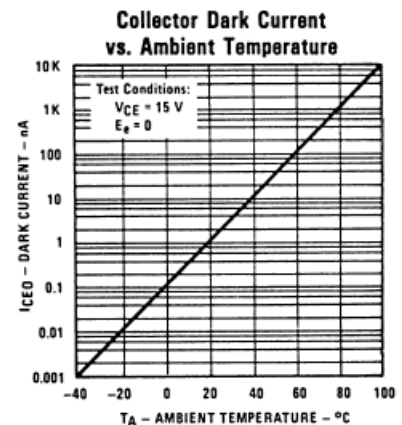
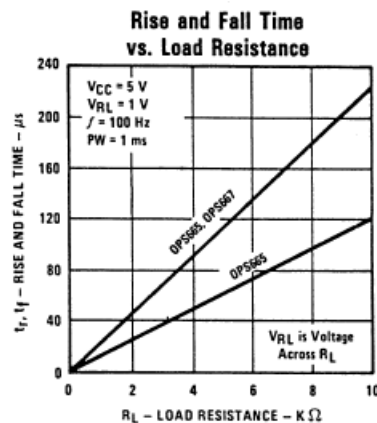
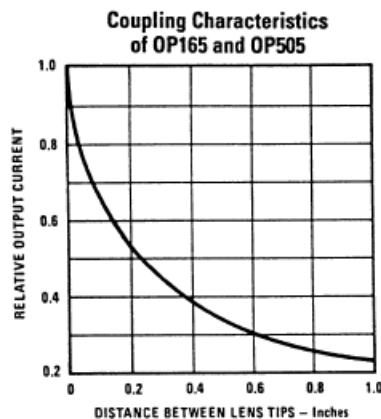
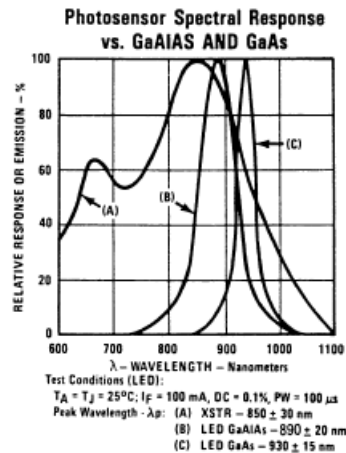
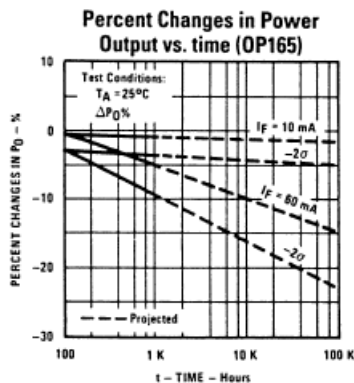
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## Performance

OPS665, OPS666, OPS667



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# LED and Photosensor Pairs

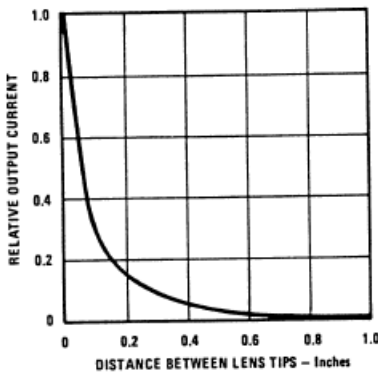
OPS665, OPS666, OPS667, OPS691, OPS692, OPS693, OPS698



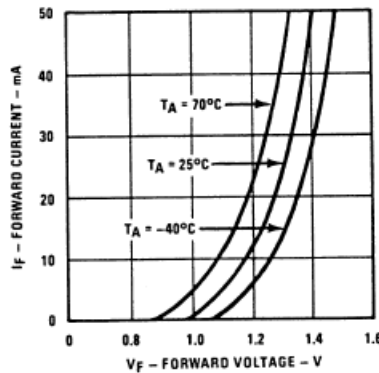
## Performance

OPS691, OPS692, OPS693

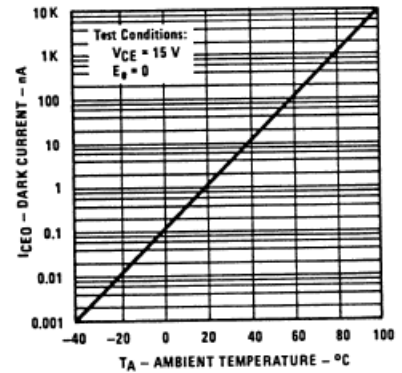
**Coupling Characteristics of OP140 and OP550**



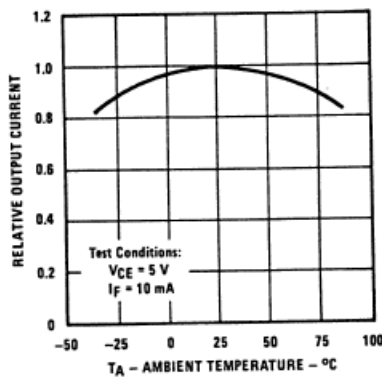
**Forward Current vs Forward Voltage**



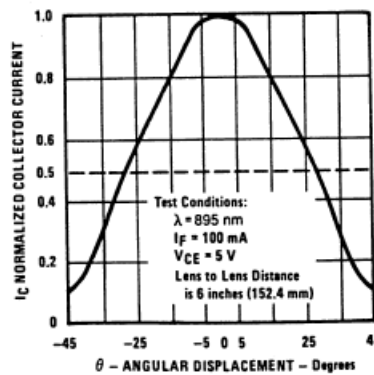
**Dark Current vs Free Air Temperature**



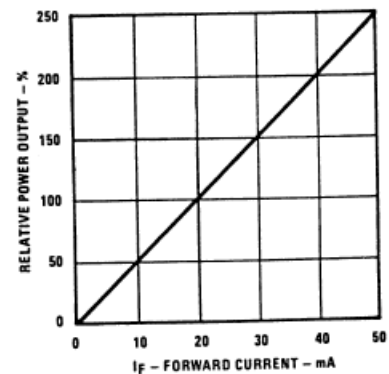
**Relative Output Current vs Free Air Temperature**



**Normalized Collector Current vs Angular Displacement**



**Relative Power Output vs Forward Current (LED)**



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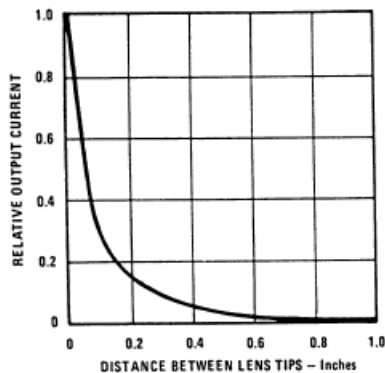
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OPS693, OPS698



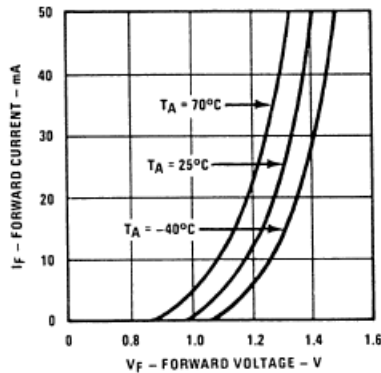
## Performance

### OPS698

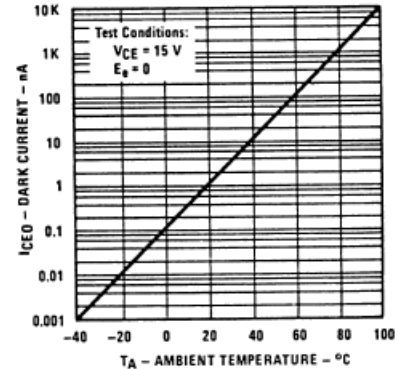
Coupling Characteristics  
of OP145 and OP555



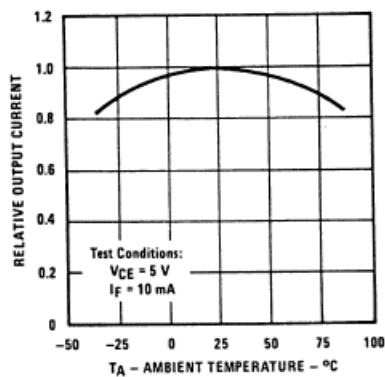
Forward Current vs  
Forward Voltage



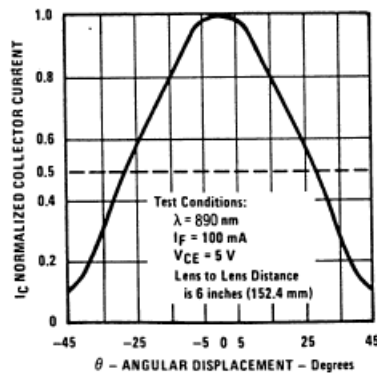
Dark Current vs  
Free Air Temperature



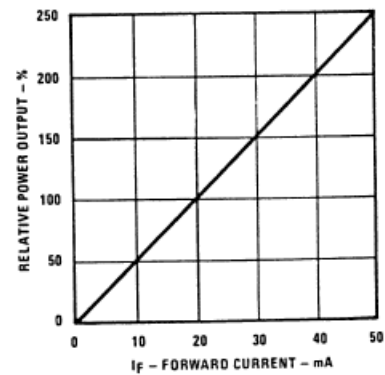
Relative Output Current vs  
Free Air Temperature



Normalized Collector Current vs  
Angular Displacement



Relative Power Output vs  
Forward Current (LED)



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С конца 2013 года компания активно расширяет линейку поставок компонентов по направлению коаксиальный кабель, кварцевые генераторы и конденсаторы (керамические, пленочные, электролитические), за счёт заключения дистрибьюторских договоров

Мы предлагаем:

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- Специальные условия для постоянных клиентов.
- Подбор аналогов.
- Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.
- Приемлемые сроки поставки, возможна ускоренная поставка.
- Доставку товара в любую точку России и стран СНГ.
- Комплексную поставку.
- Работу по проектам и поставку образцов.
- Формирование склада под заказчика.
- Сертификаты соответствия на поставляемую продукцию (по желанию клиента).
- Тестирование поставляемой продукции.
- Поставку компонентов, требующих военную и космическую приемку.
- Входной контроль качества.
- Наличие сертификата ISO.

В составе нашей компании организован Конструкторский отдел, призванный помогать разработчикам, и инженерам.

Конструкторский отдел помогает осуществить:

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- Техническую поддержку проекта.
- Защиту от снятия компонента с производства.
- Оценку стоимости проекта по компонентам.
- Изготовление тестовой платы монтаж и пусконаладочные работы.



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