

LED and Photosensor Pairs

OPS665, OPS666, OPS667

OPS690, OPS691, OPS692, OPS693

OPS695, OPS696, OPS697, OPS698



Features:

- High current transfer ratio
- Low-cost plastic package
- T-1 package style with three current range selections (OPS665, OPS666, OPS667)
- Lateral side-looking clear plastic package (OPS690, OPS691, OPS692, OPS693 and OPS695, OPS696, OPS697, 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 (**OPS690, OPS691, OPS692, OPS693 and OPS695, OPS696, OPS697, 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

Ordering Information				
Part Number	Output	Package Style	Description	Lead Length
OPS665	Transistor	T-1	Gallium arsenide infrared emitting diode (OP165) NPN silicon phototransistor (OP505)	0.50" (~1.700 mm)
OPS666	Transistor	T-1	Gallium arsenide infrared emitting diode (OP165) NPN silicon phototransistor (OP505)	0.50" (~1.700 mm)
OPS667	Transistor	T-1	Gallium arsenide infrared emitting diode (OP165) NPN silicon phototransistor (OP505)	0.50" (~1.700 mm)
OPS690	Transistor	Lateral Side-looking	Gallium arsenide infrared emitting diode (OP140) NPN silicon phototransistor (OP550)	0.50" (~1.700 mm)
OPS691	Transistor	Lateral Side-looking	Gallium arsenide infrared emitting diode (OP140) NPN silicon phototransistor (OP550)	0.50" (~1.700 mm)
OPS692	Transistor	Lateral Side-looking	Gallium arsenide infrared emitting diode (OP140) NPN silicon phototransistor (OP550)	0.50" (~1.700 mm)
OPS693	Transistor	Lateral Side-looking	Gallium arsenide infrared emitting diode (OP140) NPN silicon phototransistor (OP550)	0.50" (~1.700 mm)
OPS695	Transistor	Lateral Side-looking	Gallium arsenide infrared emitting diode (OP145) NPN silicon phototransistor (OP555)	0.50" (~1.700 mm)
OPS696	Transistor	Lateral Side-looking	Gallium arsenide infrared emitting diode (OP145) NPN silicon phototransistor (OP555)	0.50" (~1.700 mm)
OPS697	Transistor	Lateral Side-looking	Gallium arsenide infrared emitting diode (OP145) NPN silicon phototransistor (OP555)	0.50" (~1.700 mm)
OPS698	Transistor	Lateral Side-looking	Gallium arsenide infrared emitting diode (OP145) NPN silicon phototransistor (OP555)	0.50" (~1.700 mm)



RoHS

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.

OPTEK Technology, Inc.
1645 Wallace Drive, Carrollton, TX 75006 | Ph: +1 972 323 2200
www.optekinc.com | www.ttelectronics.com

LED and Photosensor Pairs

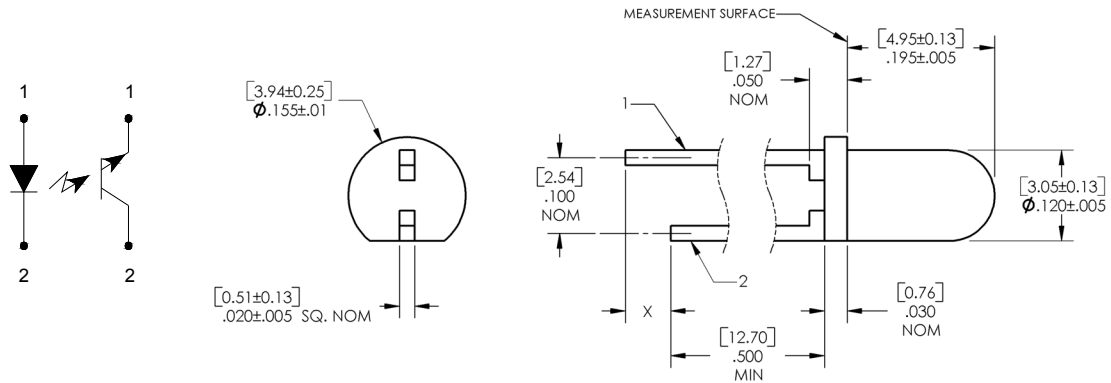


OPS665, OPS666, OPS667

OPS690, OPS691, OPS692, OPS693

OPS695, OPS696, OPS697, OPS698

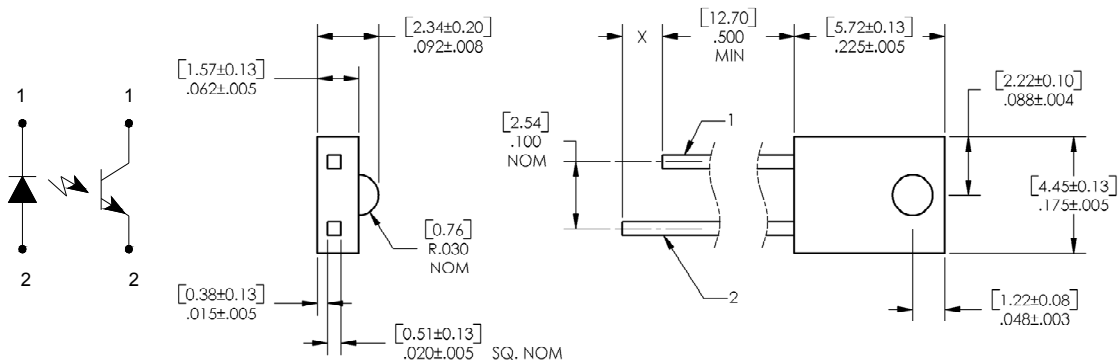
OPS665, OPS666, OPS667



DIMENSIONS ARE IN INCHES AND [MILLIMETERS].

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

OPS690, OPS691, OPS692, OPS693



DIMENSIONS ARE IN INCHES AND [MILLIMETERS].

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

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.

OPTEK Technology, Inc.
1645 Wallace Drive, Carrollton, TX 75006 | Ph: +1 972 323 2200
www.optekinc.com | www.ttelectronics.com

LED and Photosensor Pairs

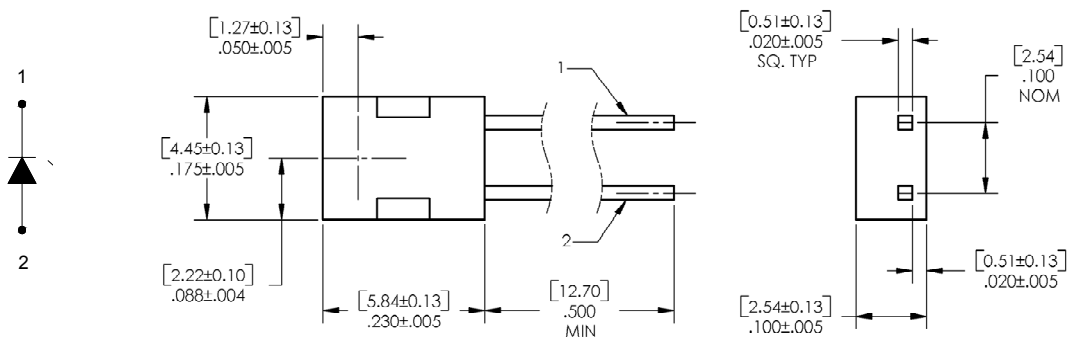
OPS665, OPS666, OPS667

OPS690, OPS691, OPS692, OPS693

OPS695, OPS696, OPS697, OPS698



OPS695, OPS696, OPS697, OPS698



DIMENSIONS ARE IN INCHES AND [MILLIMETERS].

Pin #	Diode
1	Cathode
2	Anode

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.

OPTEK Technology, Inc.
 1645 Wallace Drive, Carrollton, TX 75006 | Ph: +1 972 323 2200
www.optekinc.com | www.ttelectronics.com

LED and Photosensor Pairs

OPS665, OPS666, OPS667

OPS690, OPS691, OPS692, OPS693

OPS695, OPS696, OPS697, OPS698



Electrical Specifications

Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ unless otherwise noted)	
Storage & Operating Temperature Range	-40°C to +100°C
Lead Soldering Temperature [1/16 inch (1.6mm) from the case for 5 sec. with soldering iron]	260°C ⁽¹⁾
Input Diode	
Forward DC Current	50 mA
Peak Forward Current (1 μs pulse width, 300 pps)	3.0 A
Reverse DC Voltage	2.0 V
Power Dissipation	100 mW ⁽²⁾
Output Photosensor (OPS665/666/667) or Output Phototransistor (OPS690/691/692/693/695/696/697/698)	
Collector-Emitter Voltage	30 V
Emitter-Collector Voltage	5 V
Power Dissipation	100 mW ⁽²⁾

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.

OPTEK Technology, Inc.
1645 Wallace Drive, Carrollton, TX 75006 | Ph: +1 972 323 2200
www.optekinc.com | www.ttelectronics.com

LED and Photosensor Pairs

OPS665, OPS666, OPS667

OPS690, OPS691, OPS692, OPS693

OPS695, OPS696, OPS697, OPS698



Electrical Specifications

Electrical Characteristics (T _A = 25° C unless otherwise noted)						
SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input Diode						
V _F	Forward Voltage	-	-	1.6	V	I _F = 20 mA
I _R	Reverse Current	-	-	100	µA	V _R = 2 V
Output Phototransistor						
V _{(BR)CEO}	Collector-Emitter Breakdown Voltage	30	-	-	V	I _C = 100 µA, E _E = 0
V _{(BR)ECO}	Emitter-Collector Breakdown Voltage	5.0	-	-	V	I _E = 100 µA, E _E = 0
I _{CEO}	Collector-Emitter Dark Current					
	OPS665/666/667	-	-	100	nA	V _{CE} = 15 V, I _F = 0, I _E = 0
	OPS690/691/692/693	-	-	100	nA	V _{CE} = 10 V, I _F = 0, I _E = 0
	OPS695/696/697/698	-	-	100	nA	V _{CE} = 10 V, I _F = 0, I _E = 0
Combined						
V _{CE(SAT)}	Collector-Emitter Saturation Voltage					
	OPS665/666/667	-	-	-	-	-
	OPS690/691/692/693	-	-	0.4	V	I _F = 20 mA, I _C = 50 µA ⁽³⁾
	OPB695/696/697/698	-	-	0.4	V	I _F = 20 mA, I _C = 50 µA ⁽³⁾
I _{C(ON)}	On-State Collector Current					
	OPS665	0.5	-	-	mA	V _{CE} = 5 V, I _F = 20 mA ⁽³⁾
	OPS666	1.0	-	-	mA	
	OPS667	5.0	-	-	mA	
	OPS690, OPS695	100	-	-	µA	V _{CE} = 10 V, I _F = 20 mA ⁽³⁾
	OPS691, OPS696	500	-	-	µA	
	OPS692, OPS697	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 mW/° C above 25° 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) - OPS690 thru OPS698

LED and Photosensor Pairs



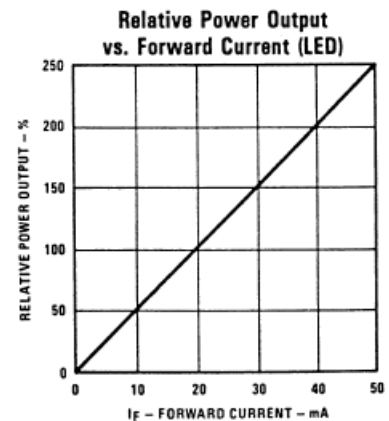
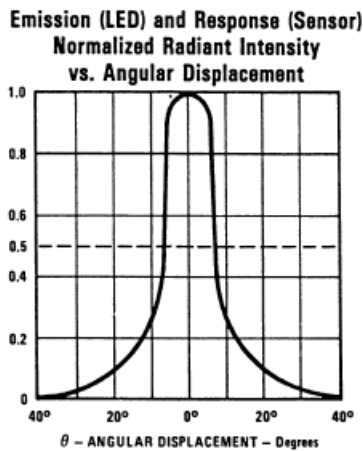
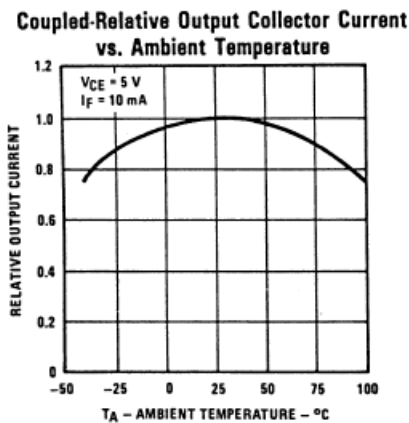
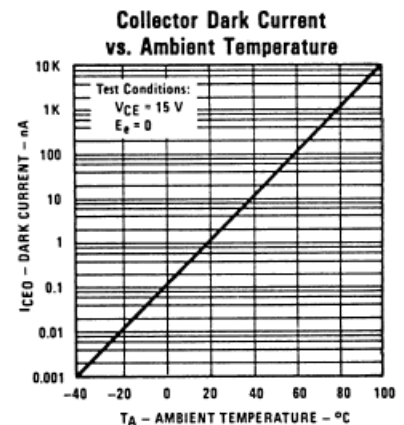
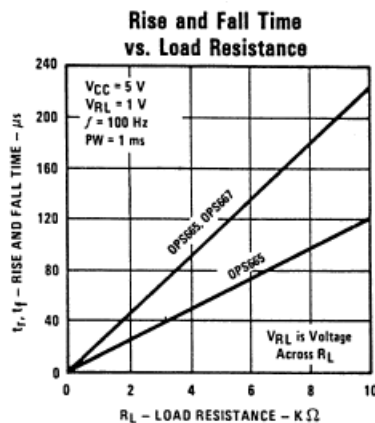
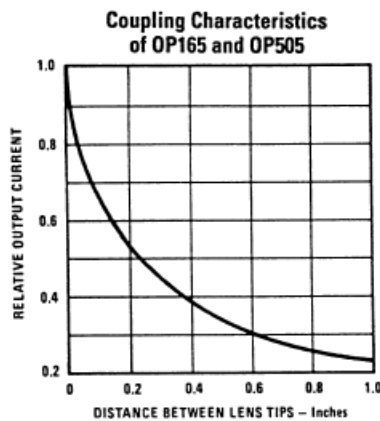
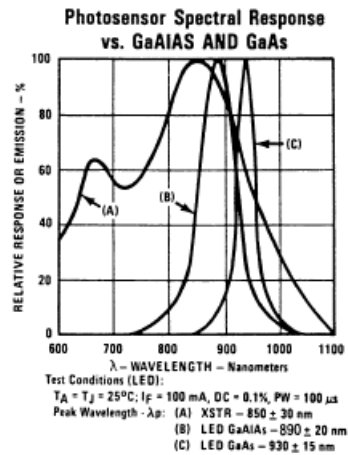
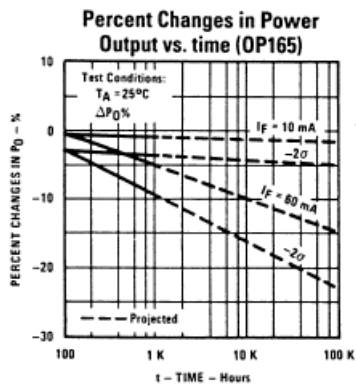
OPS665, OPS666, OPS667

OPS690, OPS691, OPS692, OPS693

OPS695, OPS696, OPS697, OPS698

Performance

OPS665, OPS666, OPS667



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.

OPTEK Technology, Inc.
 1645 Wallace Drive, Carrollton, TX 75006 | Ph: +1 972 323 2200
www.optekinc.com | www.ttelectronics.com

LED and Photosensor Pairs

OPS665, OPS666, OPS667

OPS690, OPS691, OPS692, OPS693

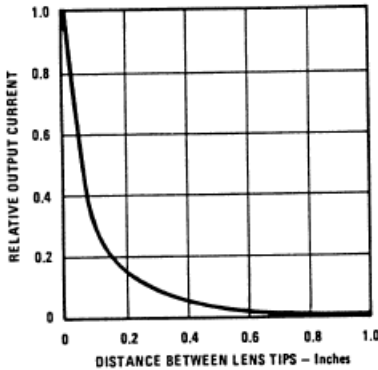
OPS695, OPS696, OPS697, OPS698



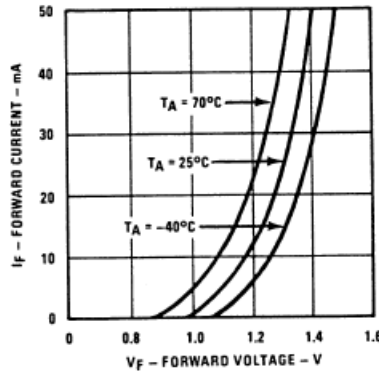
Performance

OPS690, OPS691, OPS692, OPS693

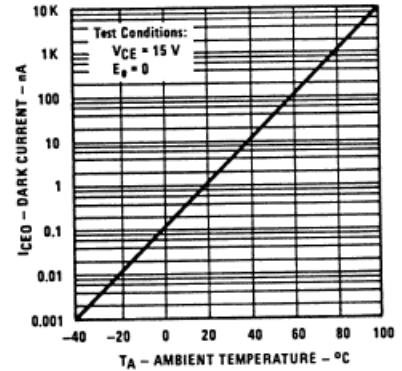
Coupling Characteristics of OP140 and OP550



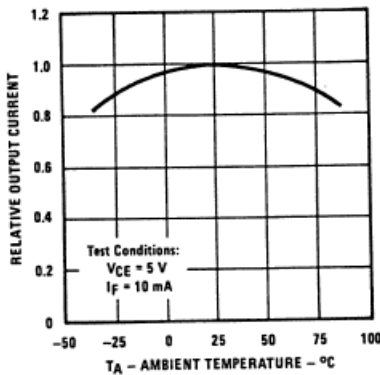
Forward Current vs Forward Voltage



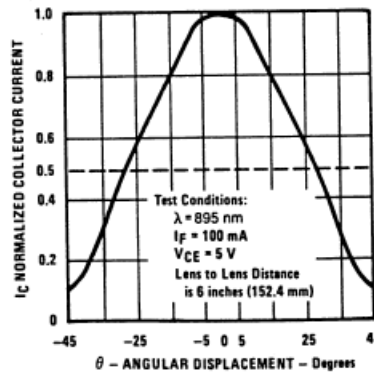
Dark Current vs Free Air Temperature



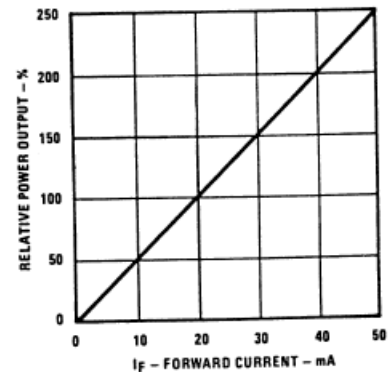
Relative Output Current vs Free Air Temperature



Normalized Collector Current vs Angular Displacement



Relative Power Output vs Forward Current (LED)



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.

OPTEK Technology, Inc.
1645 Wallace Drive, Carrollton, TX 75006 | Ph: +1 972 323 2200
www.optekinc.com | www.ttelectronics.com

LED and Photosensor Pairs

OPS665, OPS666, OPS667

OPS690, OPS691, OPS692, OPS693

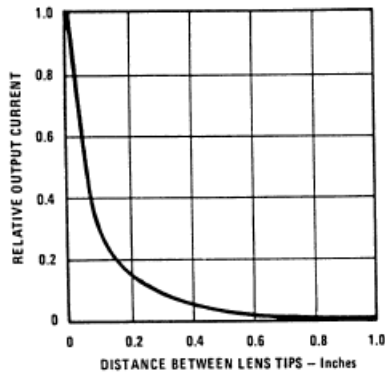
OPS695, OPS696, OPS697, OPS698



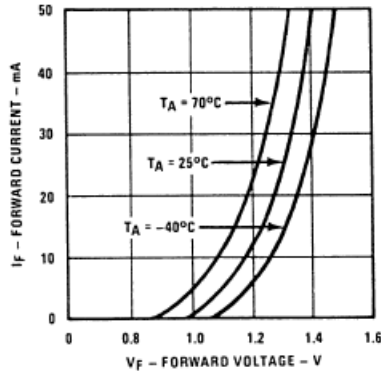
Performance

OPS695, OPS696, OPS697, OPS698

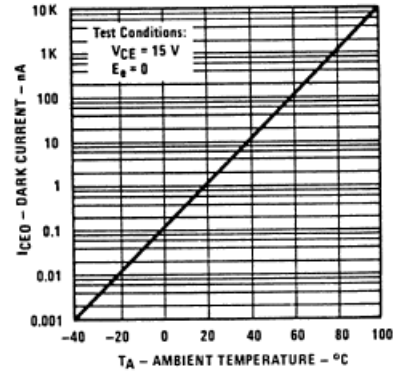
Coupling Characteristics of OP145 and OP555



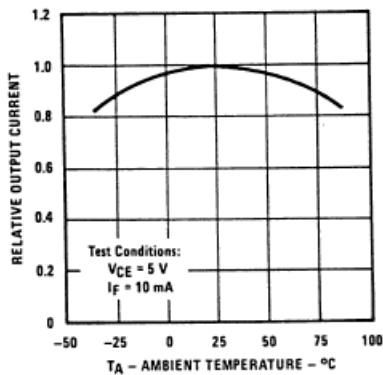
Forward Current vs Forward Voltage



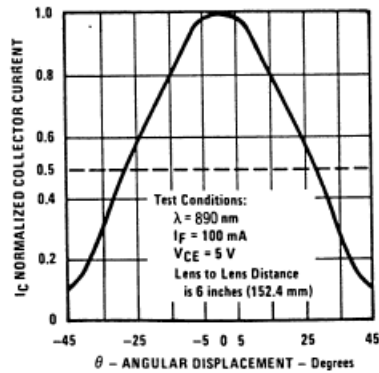
Dark Current vs Free Air Temperature



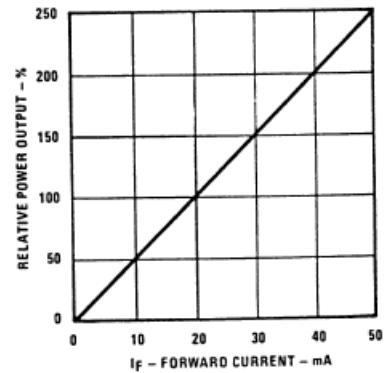
Relative Output Current vs Free Air Temperature



Normalized Collector Current vs Angular Displacement



Relative Power Output vs Forward Current (LED)



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.

OPTEK Technology, Inc.
1645 Wallace Drive, Carrollton, TX 75006 | Ph: +1 972 323 2200
www.optekinc.com | www.ttelectronics.com