NPN Phototransistor

OP800SL Series, OP800WSL Series

OP830SL Series, OP830WSL Series

Features:

- TO-18 hermetically sealed package
- Mechanically and spectrally matched to OP130 and OP230 LEDs
- TX and TXV process available (see Hi-Rel section)
- Choice of narrow or wide receiving angle
- Variety of sensitivity ranges
- Enhanced temperature range

Description:

Each device in this series consists of a NPN silicon phototransistor mounted in a hermetically sealed TO-18 package that offers high power dissipation and superior hostile environment operation. The **OP800SL, OP804SL, OP805SL** and **OP830SL** devices have a narrow receiving angle that provides excellent on-axis coupling and a bonded base lead that enables conventional transistor biasing. The **OP800WSL**, **OP801WSL**, **OP802WSL** and **OP830WSL** all have a wide receiving angle that provides relatively even reception over a large area.

Devices are 100% production tested using an infrared light source for close correlation with OPTEK's GaAs and GaAlAs emitters. *The OP800SL and devices are mechanically and spectrally matched to OP130 and OP230 series LEDs. The OP800WSL devices are mechanically and spectrally matched to OP130W and OP230W series devices.*

Please refer to Application Bulletins 208 and 210 for additional design information and reliability (degradation) data.

Applications:

- Space-limited applications
- Hostile environment applications
- Applications requiring high power dissipation

Part Number Guide — OPXXX

OP X X X X

OPTEK Component
8 —TO-18 Package
0 — Phototransistor
3 — Photodarlington

SL — Tested at 2870° K
WSL — Tested at 2870° K

Part Description:

OP80__SL = TO-18 dome lens, phototransistor
0, 4 and 5 sensitivity levels
tested with 2870° K light source

OP80__WSL = TO-18 flat lens, phototransistor
0 through 2 sensitivity levels
tested with 2870° K light source

OP830SL = TO-18 dome lens, photodarlington
tested with 2870° K light source

OP830WSL = TO-18 flat lens, photodarlington
tested with 2870° K light source

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.

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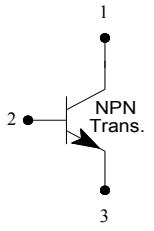
NPN Phototransistor

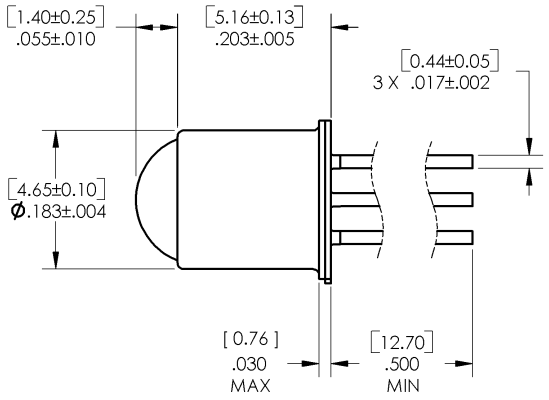
OP800SL Series, OP800WSL Series

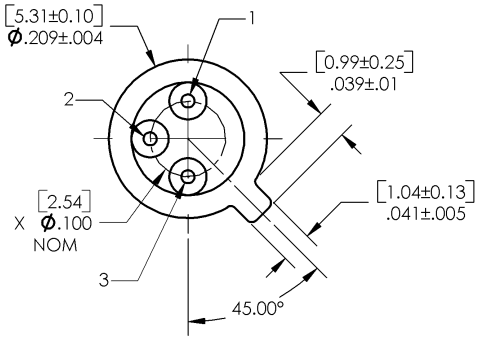
OP830SL Series, OP830WSL Series

OP800SL, OP830SL

OP800SL Series







DIMENSIONS ARE IN: [MILLIMETERS]
INCHES

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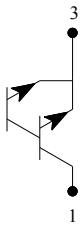
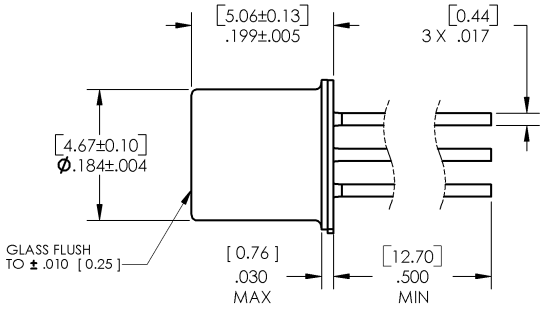
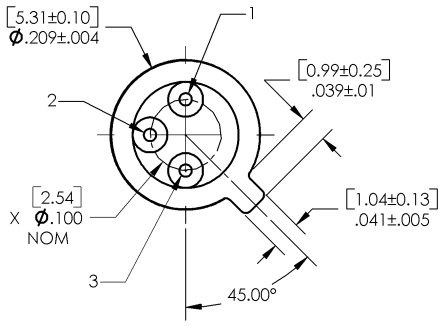
OP830SL



Pin #	OP80X _ _ _	OP830_ _ _
1	Collector	Collector
2	Base	—
3	Emitter	Emitter

OP800WSL, OP830WSL





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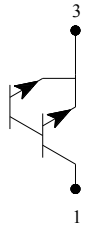
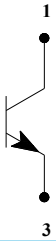
OP830WSL



OP800WSLSeries



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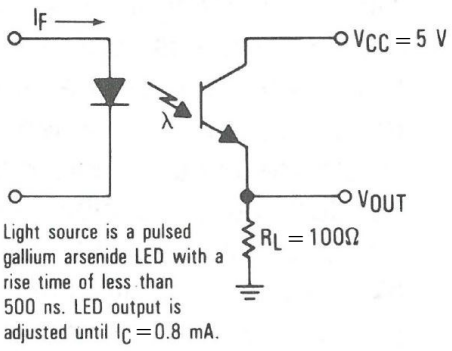
Electrical Specifications

Absolute Maximum Ratings (T_A = 25° C unless otherwise noted)	
Storage Temperature Range	-65° C to +150° C
Operating Temperature Range	-65° C to +125° C
Collector-**Base** Voltage (applies to OP800SL only - does not apply to OP800WSL)	30 V
Collector-Emitter Voltage OP800 (SL, WSL) OP830 (SL, WSL)	 30 V 15 V
Emitter-**Base** Voltage (applies to OP800 (SL, WSL) only)	5 V
Emitter-Collector Voltage (applies to all OP800 and OP830 devices)	5 V
Continuous Collector Current	50 mA
Lead Soldering Temperature [1/16 inch (1.6 mm) from case for 5 seconds with soldering iron]	260° C(1)
Power Dissipation	250 mW(2)

Notes:
1. RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering. A maximum 20 grams force may be applied to the leads when soldering.
2. Derate linearly 2.5 mW/° C above 25° C.
3. Junction temperature maintained at 25° C.
4. Light source is an unfiltered tungsten bulb operating at CT = 2870 K.

Switching Time Test Circuit



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Electrical Specifications

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

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
$I_{C(ON)}$ [3]	On-State Collector Current OP800SL OP804SL OP805SL OP800WSL OP801WSL OP802WSL	 0.5 7.0 15 0.3 0.5 2.5	 - - - - - -	 - 22 - 3 2 3	mA	V_{CE} = 5 V, E_E = 5 mW/cm [2][3][4]
	OP830SL OP830WSL	15 4	- -	- -		V_{CE} = 5 V, E_E = 0.5 mW/cm [2][3][4]
I_{CEO}	Collector Dark Current OP800 (SL, WSL) OP830 (SL, WSL)	 - -	 - -	 100 1	nA	V_{CE} = 10 V, E_E = 0
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage OP800 (SL, WSL) OP830 (SL, WSL)	 30 15	 - -	 - -	V	I_C = 100 µA
$V_{(BR)CBO}$	Collector-**Base** Breakdown Voltage [applies to OP800SL only]	30	-	-	V	I_C = 100 µA
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	5.0	-	-	V	I_E = 100 µA
$V_{(BR)EBO}$	Emitter-**Base** Breakdown Voltage [applies to OP800SL only]	5.0	-	-	V	I_E = 100 µA
$V_{CE(SAT)}$ [3]	Collector-Emitter Saturation Voltage OP800WSL OP800SL OP830SL OP830WSL	 - - - -	 - - - -	 0.4 0.4 1.2 1.2	V	I_C = 0.15 mA, E_E = 0.5 mW/cm [2][4] I_C = 0.4 mA, E_E = 5 mW/cm [2][4] I_C = 0.15 mA, E_E = 0.5 mW/cm [2][4] I_C = 1.0 mA, E_E = 0.5 mW/cm [2][4]
t_r	Rise Time	-	7	-	µs	V_{CC} = 5 V, I_C = 0.80 mA, R_L = 100 Ω (See Test Circuit)
t_f	Fall Time	-	7	-	µs	

Notes:

1. RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering. A maximum 20 grams force may be applied to the leads when soldering.
2. Derate linearly 2.5 mW/° C above 25° C.
3. Junction temperature maintained at 25° C.
4. Light source is an unfiltered tungsten bulb operating at CT = 2870 K or equivalent infrared source.

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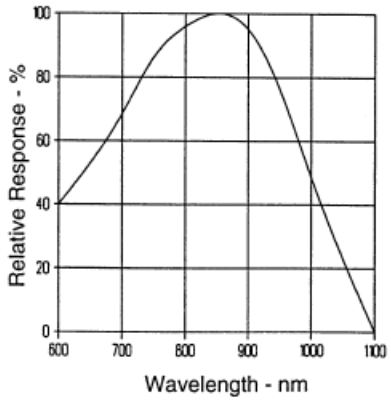
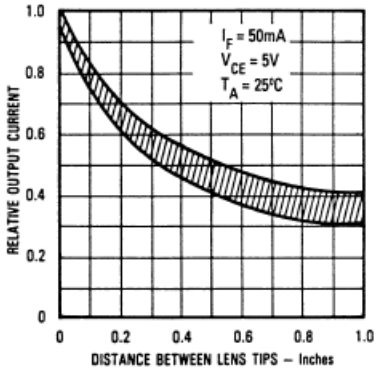
Performance

OP800SL Series

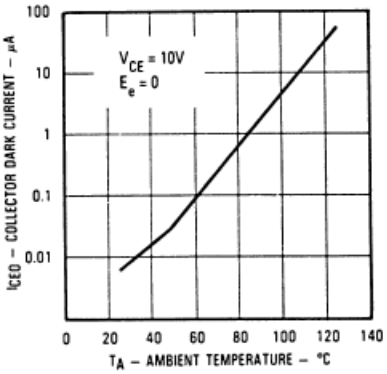
Typical Spectral Response



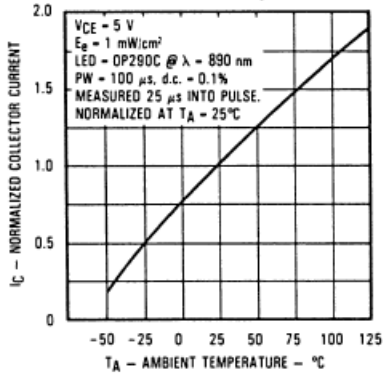
Coupling Characteristics of OP130 and OP800SL



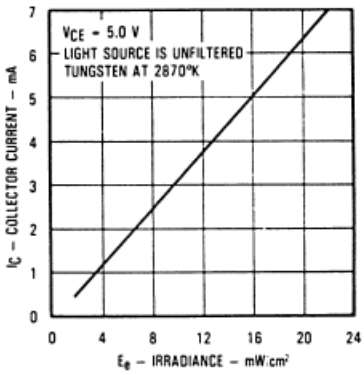
Collector Dark Current vs. Ambient Temperature



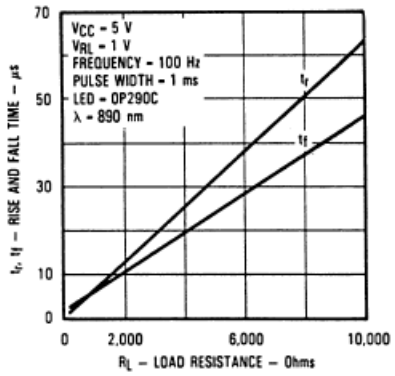
Normalized Collector Current vs. Ambient Temperature



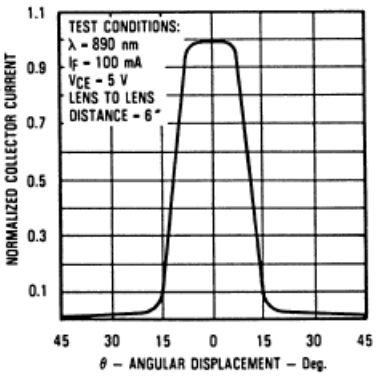
Collector Current vs. Irradiance



Rise and Fall Time vs. Load Resistance



Normalized Collector Current vs. Angular Displacement



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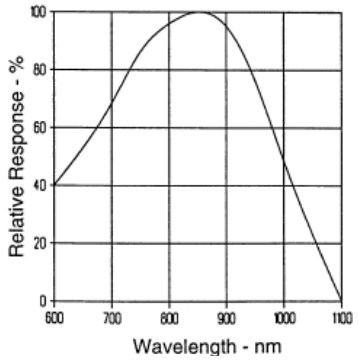
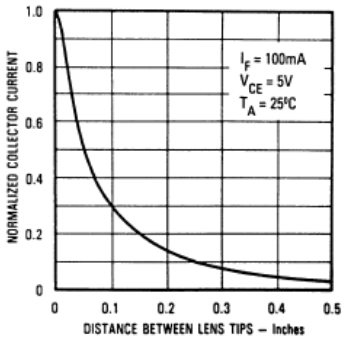
Performance

OP800WSL Series

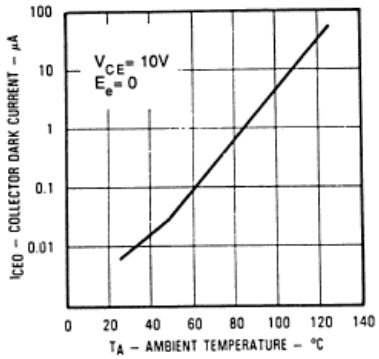
Typical Spectral Response



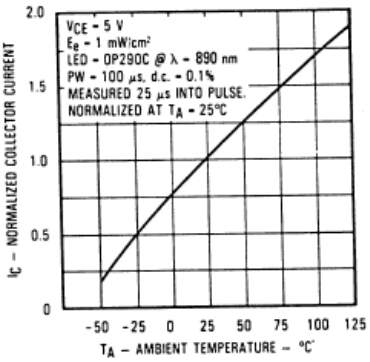
Coupling Characteristics of OP130W and OP800W



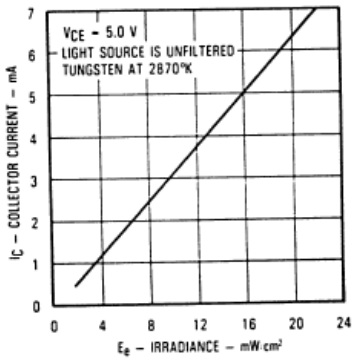
Collector Dark Current vs. Ambient Temperature



Normalized Collector Current vs. Ambient Temperature



Collector Current vs. Irradiance

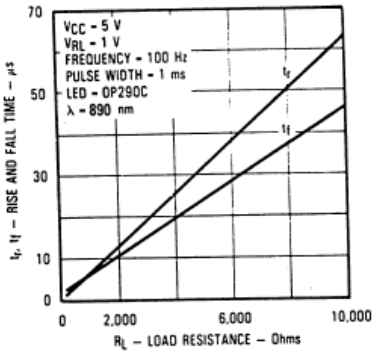


Rise and Fall Time vs. Load Resistance

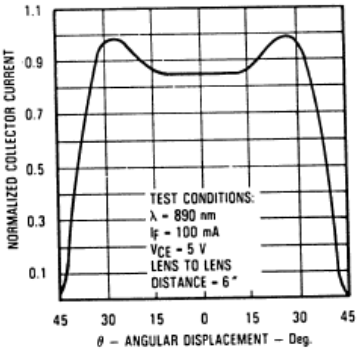
Normalized Collector Current vs. Angular Displacement

Switching Time Test Circuit

Rise and Fall Time vs. Load Resistance



Normalized Collector Current vs. Angular Displacement



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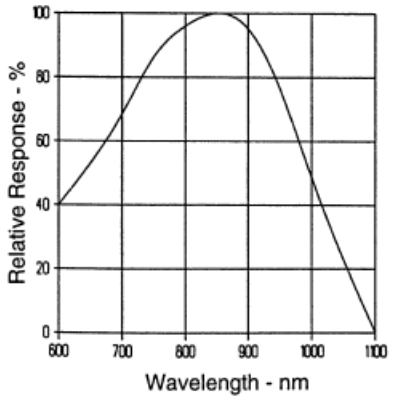
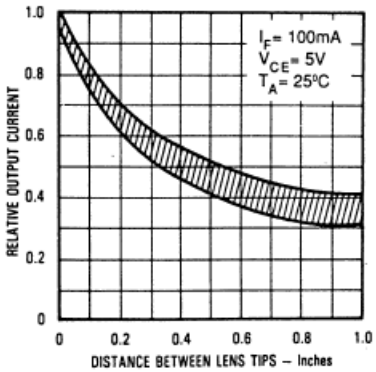
Performance

OP830SL Series

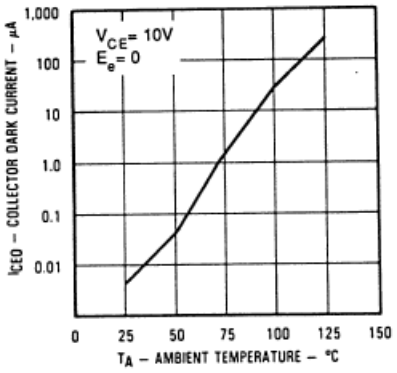
Typical Spectral Response



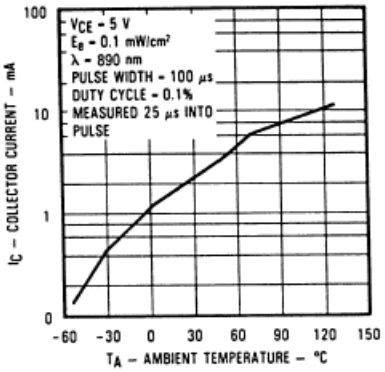
Coupling Characteristics of OP130 and OP830



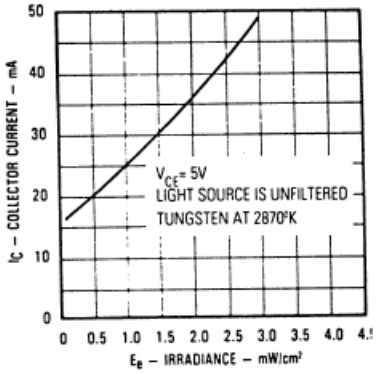
Collector Dark Current vs. Ambient Temperature



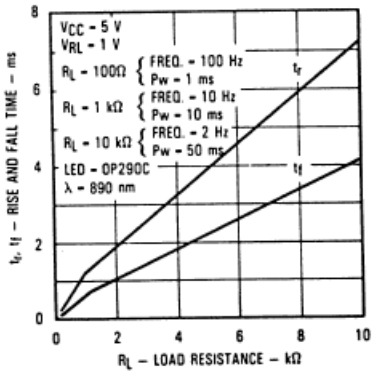
Collector Current vs. Ambient Temperature



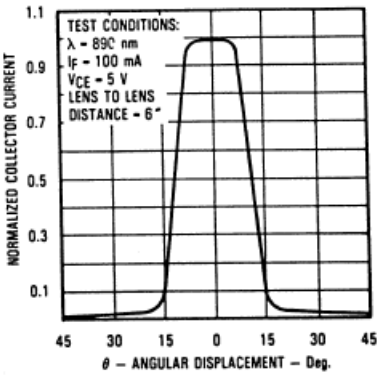
Collector Current vs. Irradiance



Rise and Fall Time vs. Load Resistance



Normalized Collector Current vs. Angular Displacement



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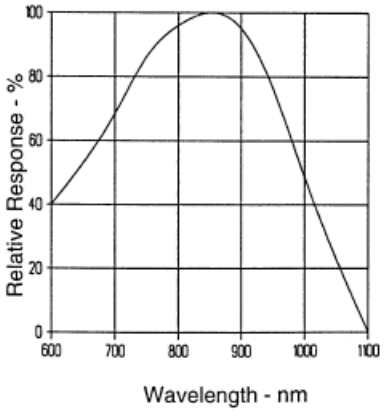
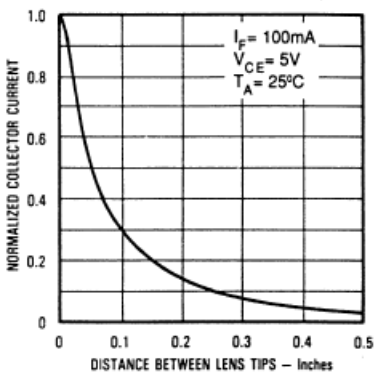
Performance

OP830WSL Series

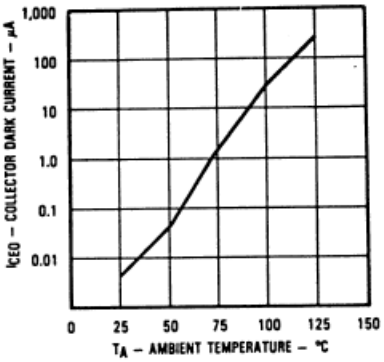
Typical Spectral Response



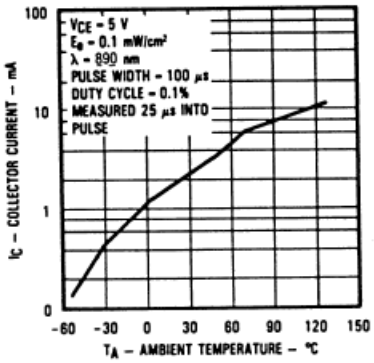
Coupling Characteristics of OP130W and OP830WSL



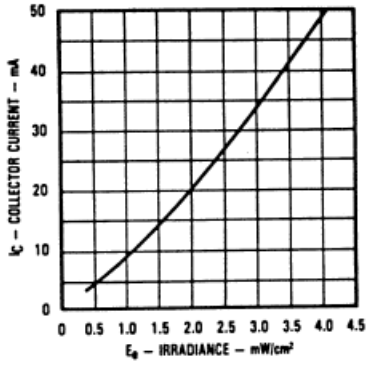
Collector Dark Current vs. Ambient Temperature



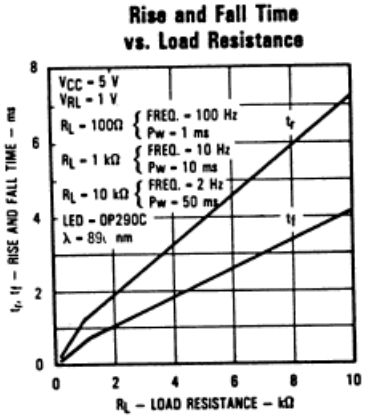
Collector Current vs. Ambient Temperature



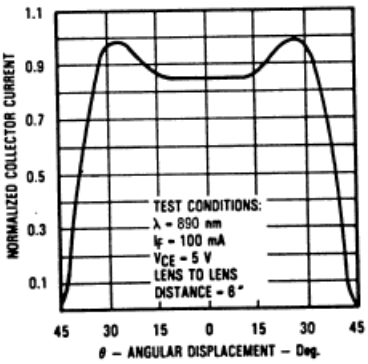
Collector Current vs. Irradiance



Rise and Fall Time vs. Load Resistance



Normalized Collector Current vs. Angular Displacement



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