

Hermetic Coaxial Silicon Phototransistor

Optoelectronic Products

FPT101

General Description

The FPT101 is a miniature phototransistor in a hermetic, welded case. A large photosensitive base combined with a flat window affords exceptional sensitivity without the need for critical alignment. In tape and card reader applications, the flat window permits flush mounting in the wear-plate thereby minimizing cross-talk. The spectral response, extending from 400 to 1100 nm, is compatible with daylight, tungsten and gallium arsenide sources.

Precision Optical Alignment

Miniature—80 Mils In Diameter

Suitable For PC Board Mounting

Applications Include Tape And Card Readers

Absolute Maximum Ratings

Maximum Temperatures and Humidity

Storage Temperature	-65°C to +150°C
Operating Temperature	-65°C to +150°C
Pin Temperature (Soldering, 10 s)	260°C
Relative Humidity at 65°C	85%

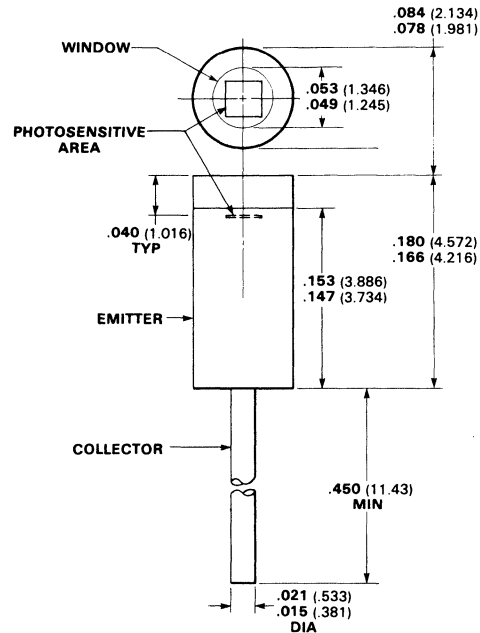
Maximum Power Dissipation

Total Dissipation at $T_C = 25^\circ\text{C}$	75 mW
Derate Linearly from 25°C	0.6 mW/°C

Maximum Voltages and Currents (Note 1)

$V_{CE(sus)}$ Collector-to-Emitter Sustaining Voltage	30 V
$V_{EC(sus)}$ Emitter-to-Collector Sustaining Voltage	5 V
I_C Collector Current	25 mA

Package Outline



Notes

All dimensions in inches **bold** and millimeters (parentheses)
Tolerance unless specified = $\pm .015$ ($\pm .381$)

Typical Electrical Characteristics

FPT101

Electrical Characteristics $T_A = 25^\circ\text{C}$

Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
$V_{CEO(sus)}$	Collector-to-Emitter Sustaining Voltage	30	60		V	$I_C = 0.1\text{ mA}$, $H < 0.1\text{ }\mu\text{W}/\text{cm}^2$
BV_{ECO}	Emitter-to-Collector Breakdown Voltage		7.0		V	$I_C = 0.1\text{ mA}$, $H < 0.1\text{ }\mu\text{W}/\text{cm}^2$
$V_{CE(sat)}$	Collector Saturation Voltage (Note 2)		0.25	0.3	V	$I_C = 0.4\text{ mA}$, $H = 20\text{ mW}/\text{cm}^2$
I_{CEO}	Collector Dark Current		2.0	100	nA	$V_{CE} = 5.0\text{ V}$, $H < 0.1\text{ }\mu\text{W}/\text{cm}^2$
$I_{CE(it)}$	Collector Photo Current (Notes 2 & 4)	0.8	3.5		mA	$V_{CE} = 5.0\text{ V}$, $H = 20\text{ mW}/\text{cm}^2$
$I_{CE(it)}$	Collector Photo Current (Notes 2 & 4)		0.8		mA	$V_{CE} = 5.0\text{ V}$, $H = 5.0\text{ mW}/\text{cm}^2$

Notes

- These are steady-state limits. The factory should be consulted on applications involving pulsed or low duty cycle operation.
- Irradiation source is an unfiltered tungsten lamp operated at 2854°K color temperature. Unless otherwise stated, all H values refer to this color temperature.
- Switching time is defined here as the 10% to 90% rise time of I_{CE} for an irradiance step input. The rise and fall times are essentially equal.
- Silicon radiometric photocurrent efficiency with typical GaAs irradiance is approximately three times greater than with tungsten at 2854°K color temperature. Therefore, all graphs with H as a parameter of variable will apply for GaAs irradiance if the H values are divided by three.
- Emitter is connected to the case.

Relative Spectral Response

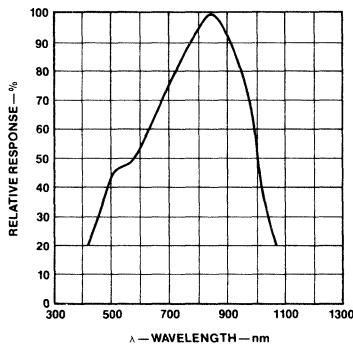
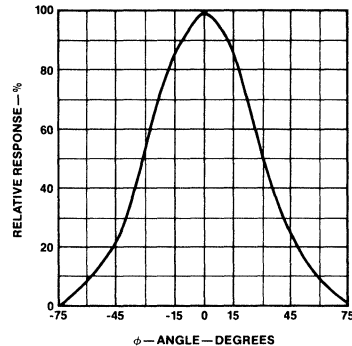


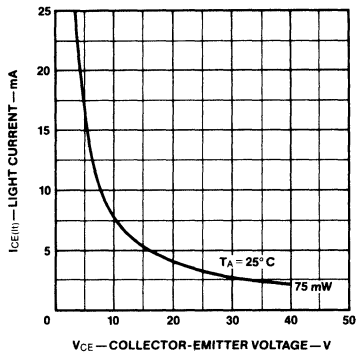
Photo Current vs Angle of Incidence



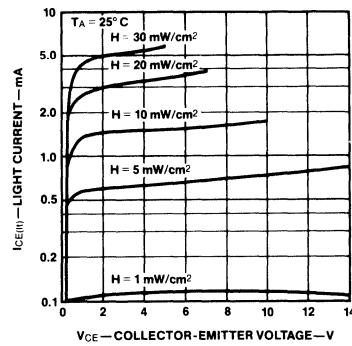
Typical Electrical Characteristic Curves

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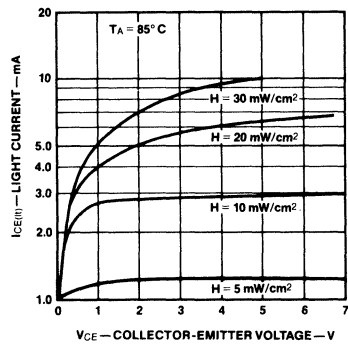
Maximum Power Limits



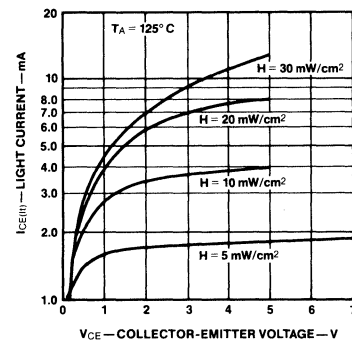
Collector Characteristics



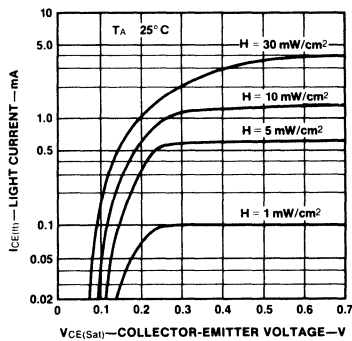
Collector Characteristics



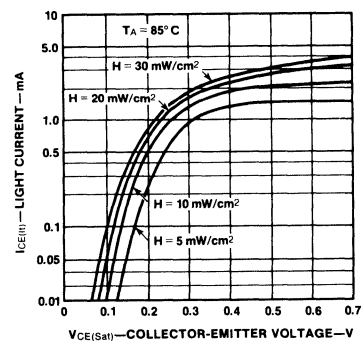
Collector Characteristics



Saturation Voltage Characteristics



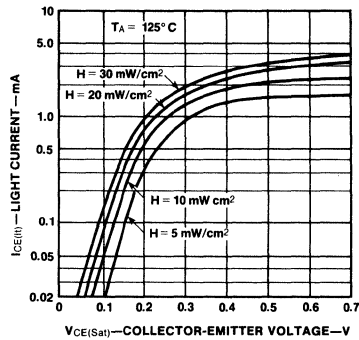
Saturation Voltage Characteristics



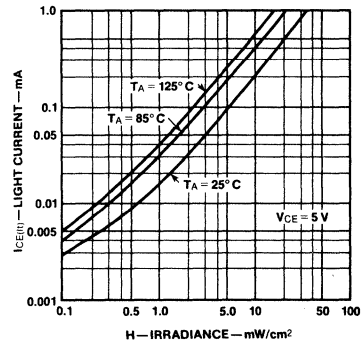
Typical Electrical Characteristic Curves (Cont'd)

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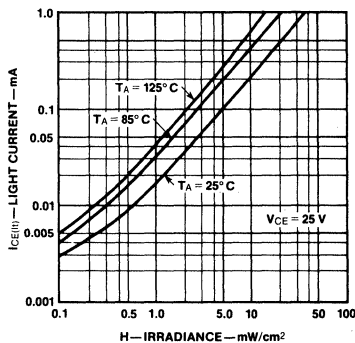
Saturation Voltage Characteristics



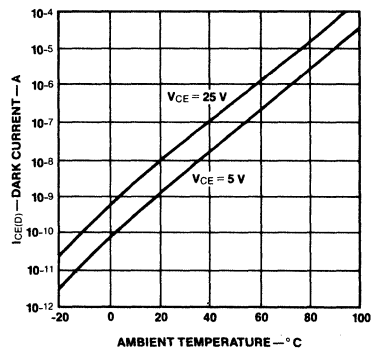
Light Current vs Irradiance



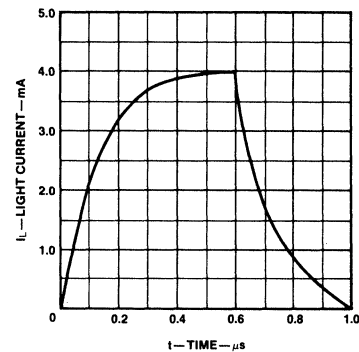
Light Current vs Irradiance



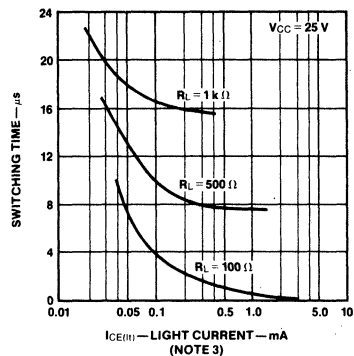
Dark Current Characteristics



Light Current vs Time



Switching Time vs Light Current



Typical Electrical Characteristic Curves (Cont'd)

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Switching Time vs Light Current

