General-Purpose, High-Sensitivity Silicon Phototransistors

FPT132 FPT137

Optoelectronic Products

General Description

The FPT 132 and FPT137 are silicon nitride protected npn Planar phototransistors with exceptionally stable characteristics and high illumination sensitivity. The case is made of a special plastic compound with transparent resin encapsulation that exhibits stable characteristics under high humidity conditions.

High Illumination Sensitivity
Low Cost

Absolute Maximum Ratings

Maximum Temperatures and Humidity

Storage Temperature	−55°C to +100°C
Operating Temperature	−55°C to +85°C
Pin Temperature (Soldering, 5 s)	260°C
Relative Humidity at 65°C	85%

Maximum Power Dissipation (Note 3)

Total Dissipation at T_C = 25°C	200 mW
Derate Linearly from 25°C	3.33 mW/°C
Total Dissipation at T_A = 25°C	100 mW
Derate Linearly from 25°C	1.67 mW/°C

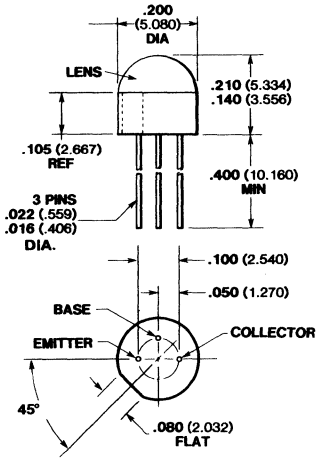
Maximum Voltages and Current (Note 4)

$V_{CEO(sus)}$	Collector-to-Emitter Sustaining Voltage (Note 4)	10 V
I_C	Collector Current	25 mA

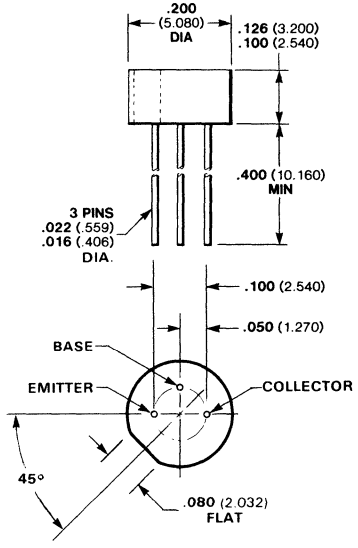
Package Outlines

FPT132

PHYSICAL DIMENSIONS



FPT137



Notes
All dimensions in inches **bold** and millimeters (parentheses)
Tolerance unless specified = ±.015 (±.381)

Typical Electrical Characteristics

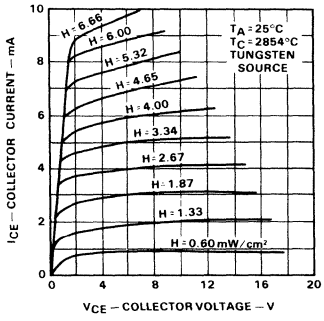
FPT132 FPT137

Electrical Characteristics $T_A = 25°C$

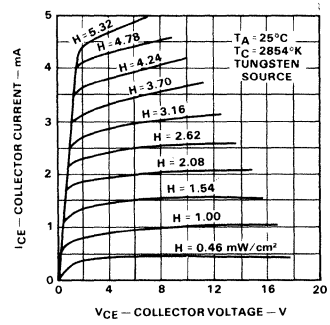
Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
$V_{CEO(sus)}$	Collector-to-Emitter Sustaining Voltage (Note 4)	10	30		V	I_C = 1 mA (Pulsed)
BV_{ECO}	Emitter-to-Collector Breakdown Voltage (Note 4)		3.0		V	I_{EC} = 100 μA
$V_{CE(sat)}$	Collector-to-Emitter Saturation Voltage, Tungsten Source (Note 2)		0.15	0.7	V	I_C = 1 mA, H = 20 mW/cm²
I_{CEO}	Collector Dark Current (Note 4)		10	500	nA	V_{CE} = 5.0 V
$I_{CE(lt)}$	Photo Current, Tungsten Source (Note 2)					
	FPT132	0.2	1.5		mA	V_{CE} = 5.0 V,
	FPT137	0.2	0.9			H = 1 mW/cm²
$I_{CE(lt)}$	Photo Current, Tungsten Source (Note 2)					
	FPT132		7.5		mA	V_{CE} = 5.0 V,
	FPT137		4.5			H = 5 mW/cm²
$I_{CE(lt)}$	Photo Current, GaAs Source (Note 3)					
	FPT132	0.4	4.5		mA	V_{CE} = 5.0 V,
	FPT137	0.4	2.7			H = 1 mW/cm²
t_r	Light Current Rise Time (Note 5)		18		μs	
t_f	Light Current Fall Time (Note 5)		18		μs	

Notes
1. These are steady-state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.
2. Measured at noted irradiance as emitted from a tungsten filament lamp at a color temperature of 2854°K. The effective photosensitive area is typically 1.25 mm² (FPT132), and 0.78 mm² (FPT137).
3. These are values obtained at noted irradiance as emitted from a GaAs source at 900 nm.
4. Measured with radiation flux intensity of less than 0.1 μW/cm² over the spectrum from 100-1500 nm.
5. Rise time is defined as the time required for I_{CE} to rise from 10% to 90% of peak value. Fall time is defined as the time required for I_{CE} to decrease from 90% to 10% of peak value. Test conditions are: V_{CE} = 5.0 V, I_{CE} = 4.0 mA, R_L = 100 Ω, GaAs source.

FPT132 Collector Current vs Collector Voltage



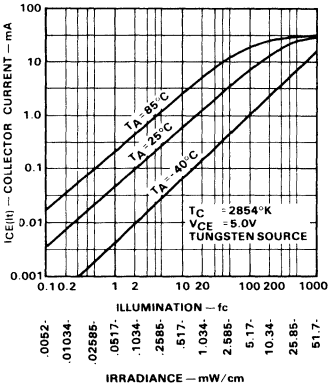
FPT137 Collector Current vs Collector Voltage



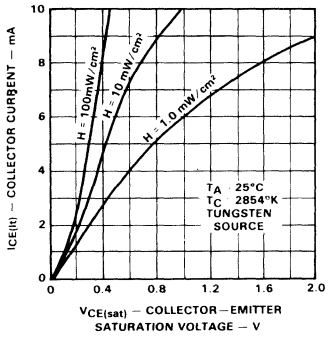
Typical Electrical Characteristic Curves

FPT132
FPT137

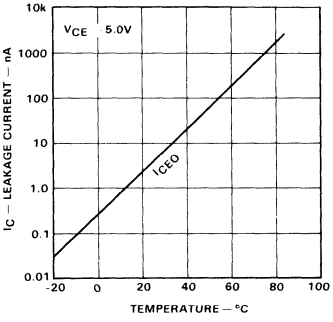
Photo Current Characteristics



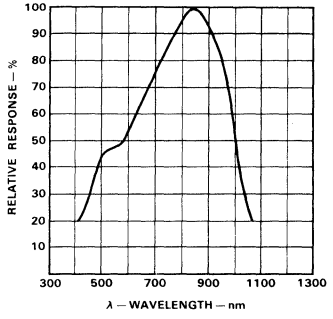
Collector-Emitter Saturation Voltage vs Collector Current



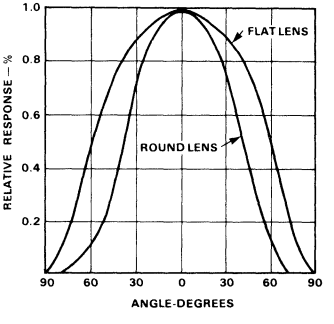
Collector Dark Current vs Temperature



Relative Spectral Response



Angular Response



Rise Time And Fall Time vs Collector Current