ISOBAUD

Radiation Tolerant Hermetic Silicon Phototransistor

IB14P1
IB14P2

Features

- Hermetic 3-pin TO-18 package
- Narrow reception angle
- High reliability and rugged construction
- High reliability screening available
- Radiation tolerant
- Operating temperature range -65℃ to +125℃

Applications

- Encoders
- Position Sensors
- Level Detection

Description

The IB14P1 / IB14P2 consist of silicon phototransistors mounted in a narrow angle hermetic TO-18 package.

Schematic Diagram

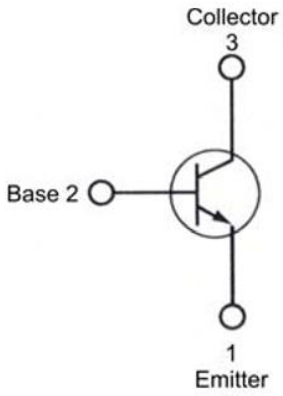

Figure 1. IB14PX Schematic Diagram

Package Dimensions in inches (mm)

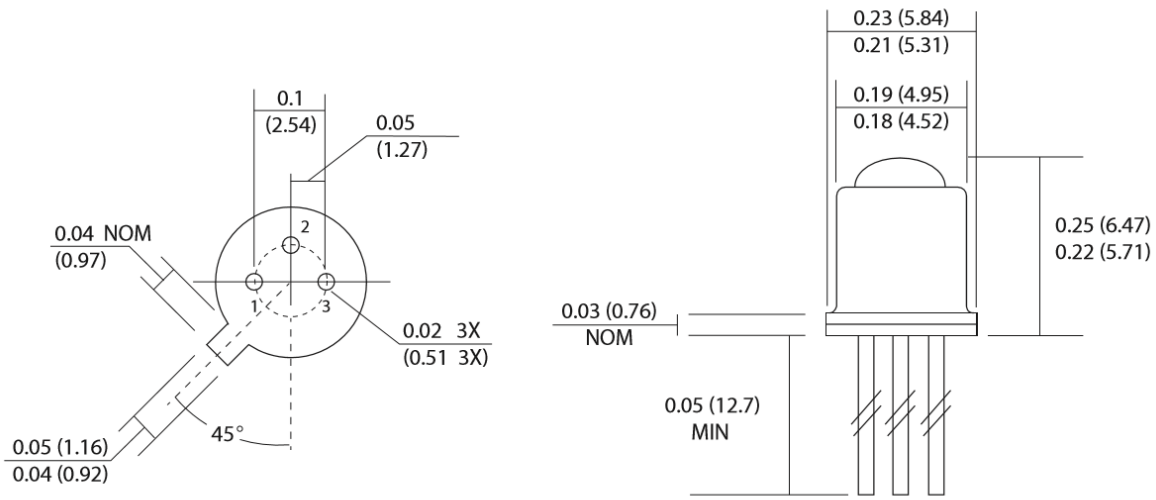

Figure 2. IB14PX Package Dimensions

Absolute Maximum Rating at 25°C (Note 1)

Symbol	*Parameters*	*Ratings*	*Units*	*Notes*
T_{OPR}	Operating temperature	-65 to +125	°C	
T_{STG}	Storage temperature	-65 to +150	°C	
T_{SOL}	Soldering temperature (10 seconds maximum)	240	°C	
P_D	Power dissipation, ambient	300	mW	2
P_D	Power dissipation, case	600	mW	3
V_{CE}	Collector-Emitter Voltage	30	V	
V_{EB}	Emitter-Base Voltage	5	V	
V_{CB}	Collector-Base Voltage	40	V	

Notes

1. When using this product, please observe the absolute maximum ratings. Only one parameter may be set at the limit to ensure no damage to the device. Exceeding any of the limits listed here may damage the device.
2. Linear derating factor: 3.0 mW/°C above 25°C ambient.
3. Linear derating factor: 6.0 mW/°C above 25°C case.

ESD Precaution

Please be advised that normal static precautions should be taken in the handling and assembly of this device to prevent damage or degradation which may be induced by electrostatic discharge (ESD).

Electrical Characteristics T_A = 25℃ *(unless otherwise specified)* (Note 1)

Symbol	*Parameters*	*Test Conditions*	*Min*	*Typ*	*Max*	*Units*	*Notes*
BV_{CEO}	Collector-Emitter Breakdown Voltage	I_C= 10mA, E_e= 0mW/cm^2	30	-	-	V	
BV_{CBO}	Collector-Base Breakdown Voltage	I_C= 100µA, E_e= 0mW/cm^2	40	-	-	V	
BV_{EBO}	Emitter-Base Breakdown Voltage	I_E= 100µA, E_e= 0mW/cm^2	5	-	-	V	
I_{C_ON}	Collector Current, On-state IB14P1	V_{CE}= 5V, E_e= 0.5mW/cm^2	6.5	-	-	mA	2, 3
	Collector Current, On-state IB14P2	V_{CE}= 5V, E_e= 0.5mW/cm^2	13	-	-	mA	2, 3
	Collector Current, On-state IB14P1/P2	V_{CE}= 5V, E_e= 0.3mW/cm^2	-	6	-	mA	2, 3
I_{CE_OFF}	Collector-Emitter Dark Current, Off-state	V_{CE}= 12V, E_e= 0mW/cm^2	-		100	nA	
$V_{CE(SAT)}$	Saturation Voltage	I_C= 0.8mA, E_e= 0.6mW/cm^2	-		0.4	V	2, 3
Θ	Reception Angle at ½ Sensitivity		-		±8	°	

Switching Characteristics

Symbol	*Parameters*	*Test Conditions*	*Typ*	Max	*Units*	*Notes*
t_r	Rise Time	I_F= 10mA, V_{CC}= 5V, R_L= 100Ω	10	-	µs	
t_f	Fall Time		12	-		

Notes

1. Performance guaranteed only under conditions listed in above tables.
2. Light Source is a GaAs LED emitting light at a peak wavelength of 940nm.
3. Figure 3 and 4 use light source of tungsten lamp at 2870K color temperature. A GaAs source of 3.0mW/cm^2 is approximately equivalent to a tungsten source of 2870K of 10mW/cm^2.

Typical Characteristic Curves

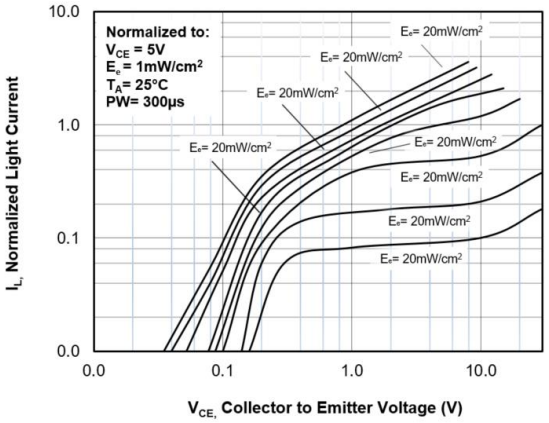

Figure 3. Light Current vs Collector-Emitter Voltage

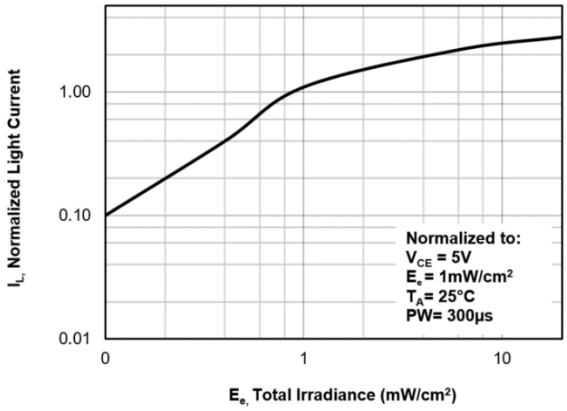

Figure 4. Normalized Light Current vs Radiation

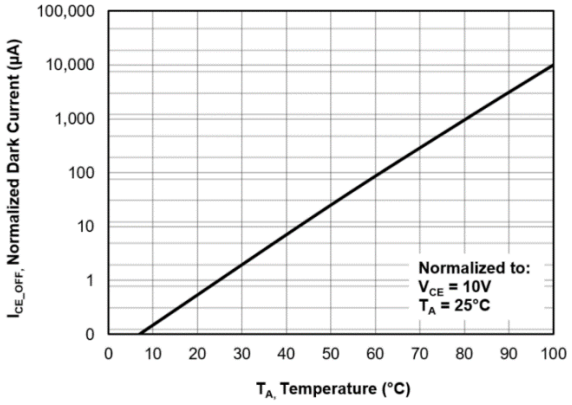

Figure 5. Dark Current vs Temperature

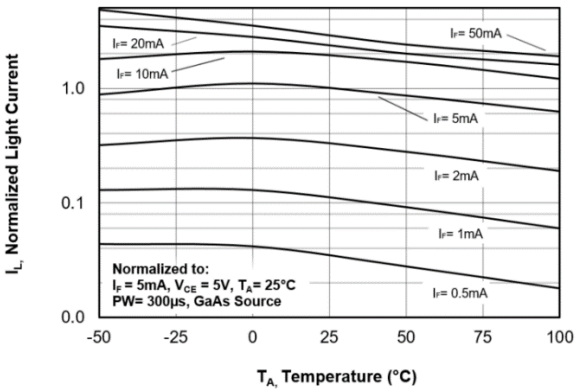

Figure 6. Light Current vs Temperature

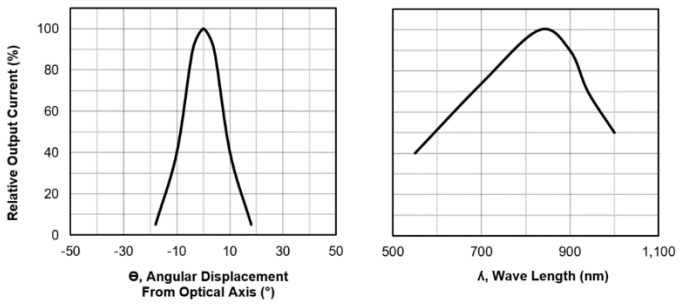

Figure 7. Angular and Spectral Response

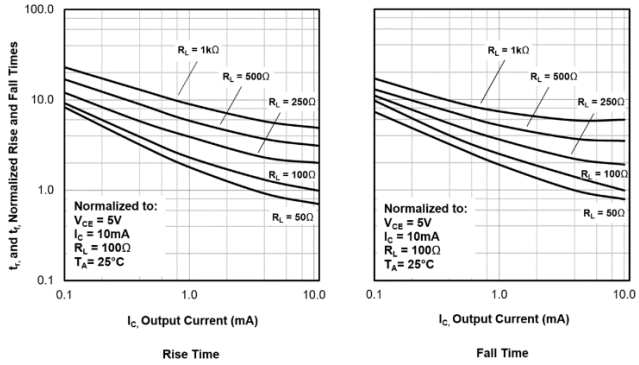

Figure 8. Switching Speed vs Output Current

Ordering Information

Manufacturing Part Number	***Part Description***
IB14P1	Radiation Tolerant Hermetic Silicon Phototransistor 3-pin TO-18 Package
IB14P2	Radiation Tolerant Hermetic Silicon Phototransistor 3-pin TO-18 Package

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