BROADCOM®

Data Sheet

HLPD-B0H0-00000

Silicon PIN Photodiode

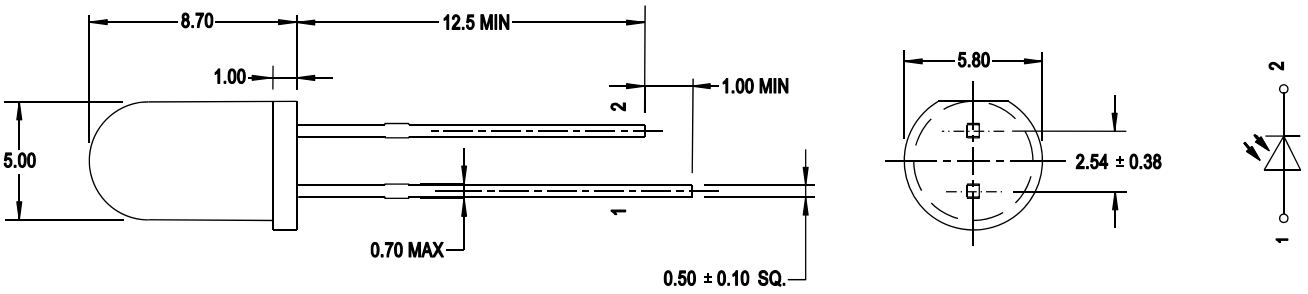
Features

- 5mm radial package
- Black epoxy package
- Spectral range of sensitivity ($\lambda_{0.1}$) 700nm to 1100nm

Applications

- Smart meter
- Industrial automation
- Smoke detector
- Light curtain

Figure 1: Package Drawing



NOTE:

1. All dimensions in millimeters (mm).
2. Tolerance is ±0.25mm unless otherwise specified.
3. Lead spacing is measured at where the leads emerge from the body.
4. Epoxy meniscus may extend up to maximum 1.00mm down the leads.

Device Selection Guide (T_J = 25°C)

Part Number	Reverse Light Current, I_{ra} (µA)		Test conditions
	Min.	Typ.	
HLPD-B0H0-00000	20	30	E_e = 1mW/cm^2, λ = 940nm, V_R = 5V

Absolute Maximum Ratings

Parameters	Rating	Unit
Reverse Voltage	20	V
Power Dissipation	150	mW
Operating Temperature Range	-40 to +85	°C
Storage Temperature Range	-40 to +100	°C

Optical and Electrical Characteristics (T_J = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Units	Test Conditions
Wavelength of Peak Sensitivity	$\lambda_{S\ max}$		960		nm	
Spectral Range of Sensitivity	$\lambda_{0.1}$	700		1100	nm	
Angle of Sensitivity	φ		±30		°	
Reverse Dark Current	I_{ro}		1	30	nA	V_R =10V, E_e = 0mW/cm^2
Open Circuit Voltage	V_{OC}		345		mV	E_e = 1mW/cm^2, λ = 940nm
Short Circuit Current	I_{SC}		27		µA	E_e = 1mW/cm^2, λ = 940nm
Temperature coefficient of V_{OC}	TC_{VOC}		-2.92		mV/°C	E_e = 1mW/cm^2, λ = 940nm
Temperature coefficient of I_{SC}	TC_{ISC}		-0.71		%/°C	E_e = 1mW/cm^2, λ = 940nm
Forward Voltage	V_F		0.86		V	I_F =10mA
Diode Capacitance	C_O		6.0		pF	V_R =0V, f = 1MHz, E_e = 0mW/cm^2

Figure 2: Relative Sensitivity vs. Wavelength

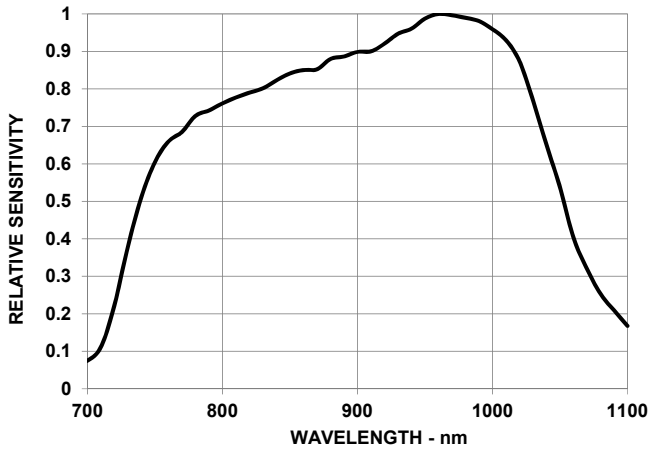


Figure 3. Relative Sensitivity vs. Angular Displacement.

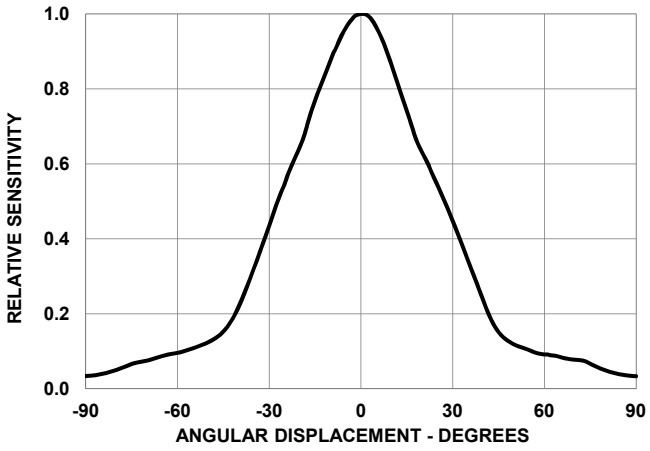


Figure 4. Reverse Light Current vs Irradiance.

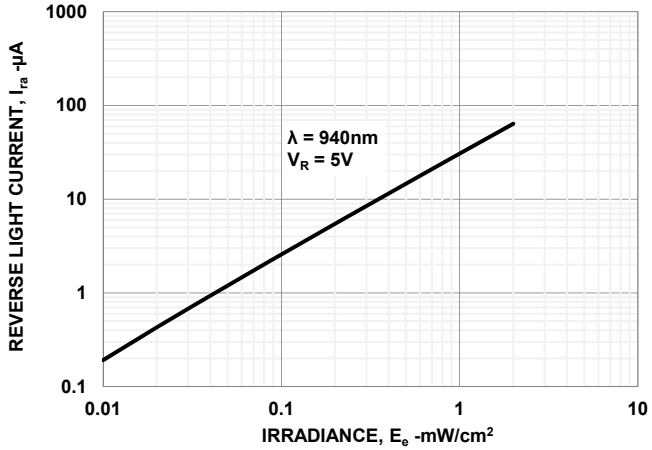


Figure 5. Reverse Dark Current vs Reverse Voltage

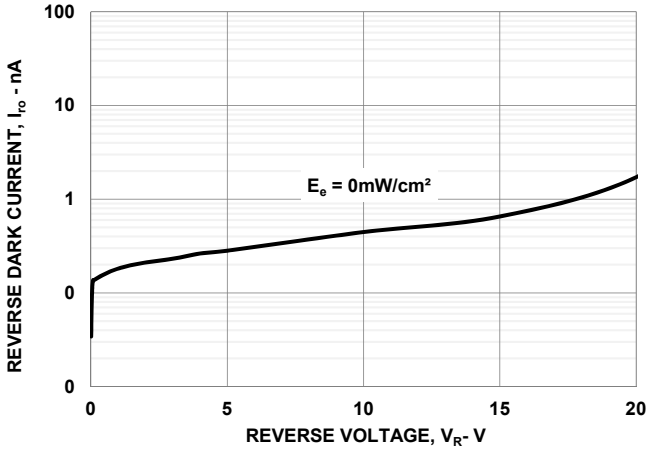


Figure 6. Reverse Dark Current vs Ambient Temperature

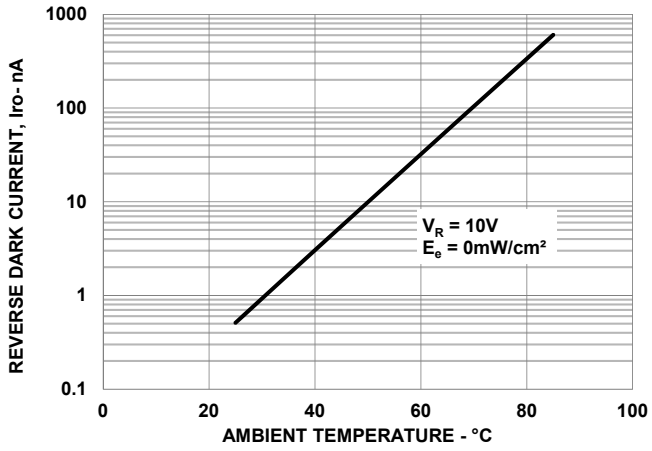


Figure 7. Relative Reverse Dark Current vs Ambient Temperature

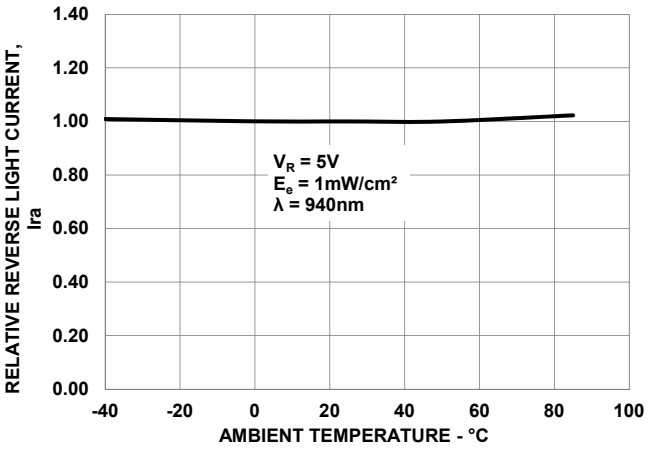
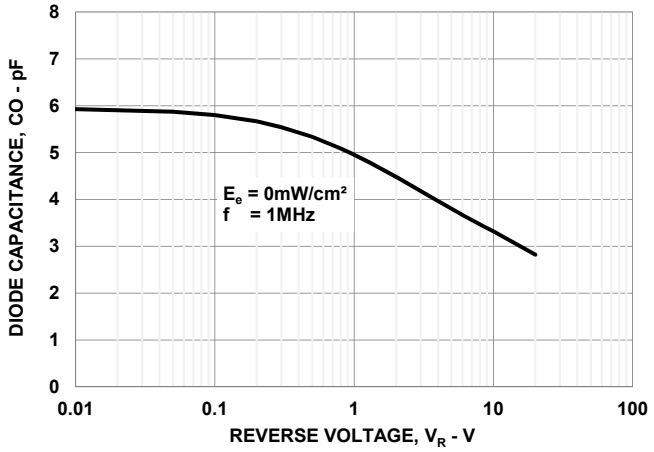


Figure 8. Diode Capacitance vs Reverse Voltage



Precautionary Notes

Soldering and Handling Precautions

- Set and maintain the wave soldering parameters according to the recommended temperature and dwell time. Perform daily check on the profile to ensure that it is always conforming to the recommended conditions. Exceeding these conditions will over-stress the package and cause premature failures.
- Use only bottom preheaters to reduce thermal stress experienced by the package.
- Recalibrate the soldering profile before loading a new type of PCB. PCB with different size and design (component density) will have different heat capacity and might cause a change in temperature experienced by the PCB if the same wave soldering setting is used
- Do not perform wave soldering more than once.
- Any alignment fixture used during wave soldering must be loosely fitted and must not apply stress on the package. Use non-metal material as it will absorb less heat during the wave soldering process.
- At elevated temperature, the package is more susceptible to mechanical stress. Allow the package to be sufficiently cooled to room temperature before handling. Do not apply stress to the package when it is hot.
- Use wave soldering to solder the package. Use hand soldering only for rework or touch up if unavoidable, but it must be strictly controlled to following conditions:
  - Soldering iron tip temperature = 315°C max.
  - Soldering duration = 2sec max.
  - Number of cycle = 1 only
  - Power of soldering iron = 50W max.
- Do not touch the package body with the soldering iron except for the soldering terminals as it may cause damage to the package.
- Confirm beforehand whether the functionality and performance of the package is affected by soldering with hand soldering.
- Keep the heat source at least 1.6mm away from the package body during soldering.
- Design appropriate hole size to avoid problem during insertion or clinching (for auto-insertable devices).

Figure 9: Recommended PCB Through Hole Size

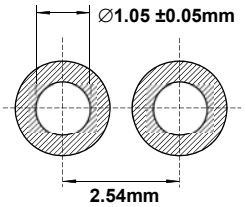
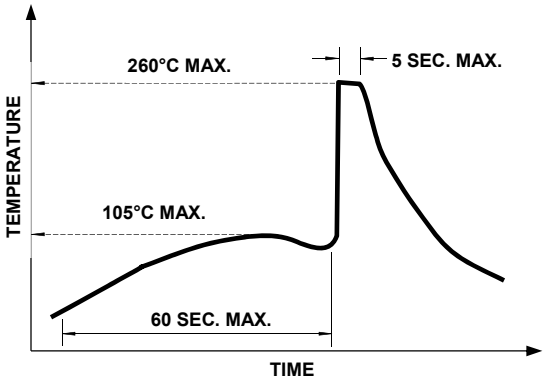


Figure 10: Recommended Wave Soldering Profile



NOTE: Refers to measurements with thermocouple mounted at the bottom of the PCB.

Lead Forming

- To pre-form or cut the leads prior to insertion and soldering onto PCB, use proper tool instead of doing it manually.
- Do not bend the leads at location less than 3mm from the package body.
- Do not use the base of the package body as fulcrum for lead bending. Secure the leads properly before bending.
- If manual lead cutting is unavoidable, cut the leads after soldering to reduce stress to the package body.

Application Precautions

- Avoid rapid change in ambient temperature, especially in high-humidity environments, because they cause condensation on the package.
- If the package is intended to be used in harsh or outdoor environment, protect the pakage against damages caused by rain water, water, dust, oil, corrosive gases, external mechanical stresses, and so on.

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