

HFE4070

High Power Fiber Optic LED, Metal Package

FEATURES

- High power LED sends 115 μ W into 100/140 micron fiber
- High speed: 85 MHz
- Optimized for 50 mA operation
- Designed to operate with Honeywell fiber optic receivers
- Metal TO-18 type package
- Metal TO-46 style package also available (HFE4050)

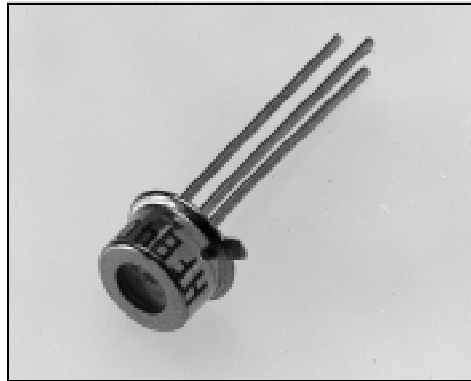
DESCRIPTION

The HFE4070 is a high radiance AlGaAs 850 nanometer LED optimized for coupling into small fiber core diameters at a forward current of 50 mA. The patented "Caprock"™ LED chip is designed to combine high power coupling with wide bandwidth. The peak wavelength is matched for use with Honeywell silicon fiber optic detectors and receivers. When the HFE4070 is used at elevated temperatures, thermal resistance must be taken into consideration.

APPLICATION

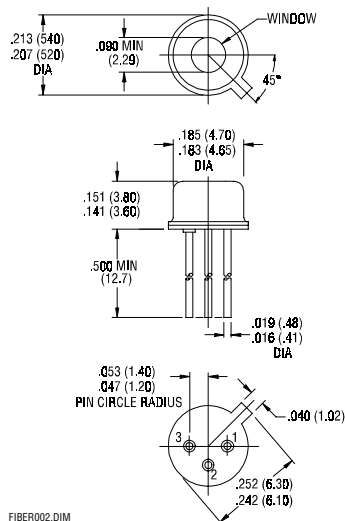
The HFE4070 is a high radiance LED packaged on a TO-18 header with a metal can. Data rates can vary from DC to above 85 MHz depending upon component application. The LED is designed for use in fiber optic communications. As the current varies (typically from 10 to 100 mA), the light intensity increases proportionally. Heat sinking is recommended to maintain the expected long life. If the HFE4070 is heat sunk the package has a typical thermal resistance of 250°C per watt. If not heat sunk, typical thermal resistance is 500°C per watt.

The HFE4070 LED provides the maximum amount of radiance for the amount of forward current in the industry. A 0.25 mm diameter glass microlens over the "Caprock"™ junction collimates the light, increasing the intensity. Thus, greater power is directed toward standard fiber optic cables.



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OUTLINE DIMENSIONS in inches (mm)



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Pinout

1. Anode (case)
2. Cathode
3. Not connected

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ELECTRO-OPTICAL CHARACTERISTICS (T_C = -40°C to +100°C unless otherwise stated)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Fiber Coupled Power	P _{OC}					I _F = 50 mA, 50/125 micron, ⁽¹⁾ 0.20 NA fiber ⁽²⁾
HFE4070-313		10	20		μW	
Over Temp. Range		-20.0	-17.0		dBm	
		7			μW	
		-21.5			dBm	
Forward Voltage	V _F	1.50	1.70	2.1	V	I _F = 50 mA
Reverse Voltage	B _{VR}	1.0	5.0		V	I _R = 10 μA
Peak Wavelength	λ _P	810	850	885	nm	I _F = 50 mA DC
Spectral Bandwidth (FWHM)	Δλ		50		nm	I _F = 50 mA DC
Response Time					ns	1 V Prebias, 100 mA peak
T = 25°C, 10-90%	t _R		6	10		
T = 25°C, 90-10%	t _F		8	10		
Analog Bandwidth	BWE		85		MHz	I _F = 100 mA DC, sinusoidal modulation ⁽²⁾
P _O Temperature Coefficient	ΔP _O /ΔT		-0.02		dB/°C	I _F = 50 mA, +40°C < T _A < +100°C
Series Resistance	r _s		4.0		Ω	DC
Capacitance	C		70		pF	V _R = 0 V, f = 1 MHz
Thermal Resistance			250		°C/W	Heat sunked ⁽²⁾
			500		°C/W	Not heat sunked

Notes

1. HFE4070 is tested using a 10 meter length of 100/140 μm dia. fiber cable, terminated in a precision ST ferrule. Actual coupled power values may vary due to alignment procedures and/or receptacle and fiber tolerances.
2. HFE4070 must be heat sunked for continuous I_F > 50 mA operation for maximum reliability (i.e. mounted in a metal connector with thermally conductive epoxy).

ABSOLUTE MAXIMUM RATINGS

(25°C Free-Air Temperature unless otherwise noted)

Storage temperature	-40 to +100°C
Case operating temperature	-40 to +100°C
Lead solder temperature	260°C, 10 s
Continuous forward current	50 mA
Continuous forward current (heat sunked)	100 mA
Reverse voltage	1 V @ 10 μA

Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational section of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods of time may affect reliability.

FIBER INTERFACE

Honeywell LEDs are designed to interface with multimode fiber with sizes ranging from 50/125 to 200/230 microns. Honeywell performs final tests using 50/125 micron core fiber. All multimode fiber optic cables between 50/125 and 200/230 should operate with similar excellent performance. See table for typical powers.

TYPICAL COUPLED POWER (μW/dBm) @ I_F=50 mA

Dia.	Index	N.A.	-313
8/125	Step	---	0.6/-32.0
50/125	Graded	0.20	20/-17.0
62.5/125	Graded	0.28	44/-13.6
100/140	Graded	0.29	116/-9.4

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ORDER GUIDE

Description	Catalog Listing
Standard screening, metal package, typical power out 20 μ W	HFE4070-313

This package is also available in special interface receptacles for interfacing to standard fiber optic cables.

WARNING

Under certain application conditions, the infrared optical output of this device may exceed Class 1 eye safety limits, as defined by IEC 825-1 (1993-11). Do not use magnification (such as a microscope or other focusing equipment) when viewing the device's output.

CAUTION

The inherent design of this component causes it to be sensitive to electrostatic discharge (ESD). To prevent ESD-induced damage and/or degradation to equipment, take normal ESD precautions when handling this product.



Fig. 1 Typical Optical Power Output vs Forward Current

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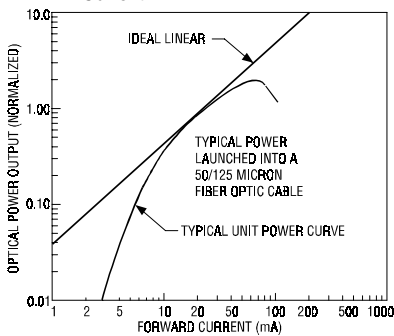


Fig. 2 Typical Spectral Output vs Wavelength

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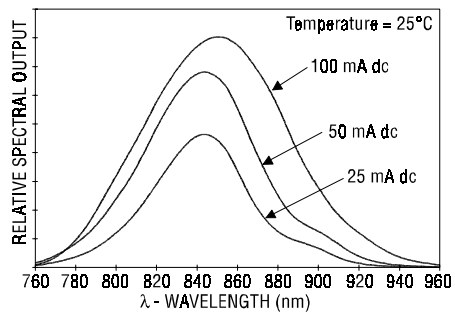
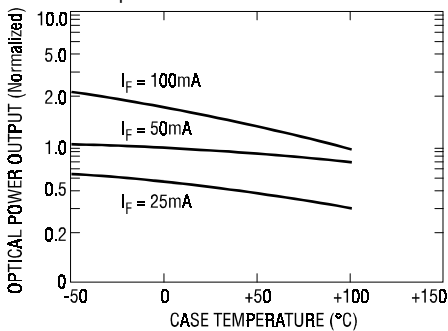


Fig. 3 Typical Optical Power Output vs Case Temperature

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All Performance Curves Show Typical Values

Honeywell reserves the right to make changes in order to improve design and supply the best products possible.

Honeywell