

HFE4070-313/XXX

High Power Fiber Optic LED

FEATURES

- High power LED sends 115 μ W into 100/140 micron fiber
- High speed: 85 MHz
- Optimized for 50 mA operation
- Wave solderable
- Designed to operate with Honeywell fiber optic receivers
- Mounting options
 - SMA single hole
 - ST single hole
 - SMA PCB
 - ST PCB
 - SMA 4 hole

DESCRIPTION

The HFE4070-313/XXX is a high radiance GaAlAs 850 nanometer LED optimized for coupling into small fiber core diameters at a forward current of upto 50 mA. The patented "Caprock"[™] LED chip combines high power coupling with wide bandwidth. The peak wavelength is matched for use with Honeywell silicon fiber optic detectors and receivers.

APPLICATION

The HFE4070-313/XXX is a high radiance LED packaged in a fiber optic connector that aligns the optical axis of the base component to the axis of the optical fiber. Data rates can vary from DC to above 85 MHz depending upon component application. The LED converts electrical current into optical power that can be used in fiber optic communications. As the current varies (typically from 10 to 100 mA), the light intensity increases proportionally.

The HFE4070-313/XXX 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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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/XXX		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	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

- HFE4070-313/XXX 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.
- HFE4070-313/XXX 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, typical power out 20 μ W	HFE4070-313/XXX

MOUNTING OPTIONS

substitute XXX with one of the following 3 letter combinations

SMA single hole	- AAA
ST single hole	- BAA
SMA PCB	- ABA
ST PCB	- BBA
SMA 4 hole	- ADA

Dimensions on page 203

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

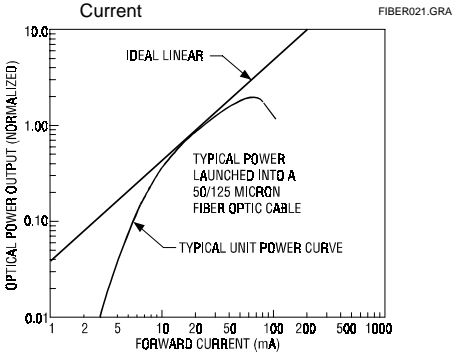


Fig. 2 Typical Spectral Output vs Wavelength

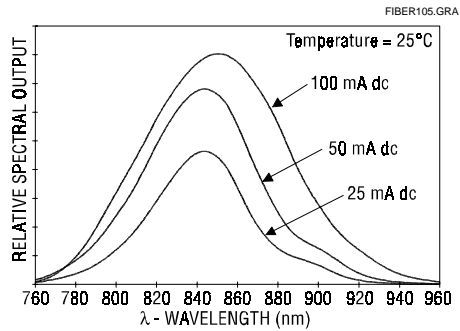
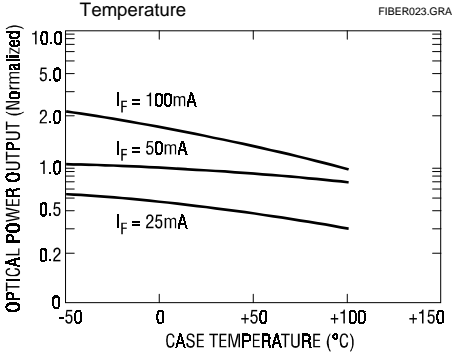


Fig. 3 Typical Optical Power Output vs Case Temperature

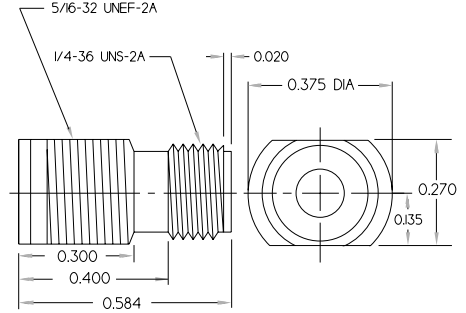


All Performance Curves Show Typical Values

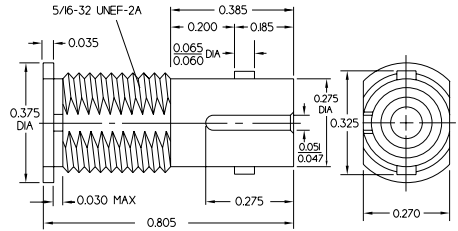
European Connectorized LEDs/Transmitters

Honeywell LED/transmitter components are available in the following connector styles. Each style has a three-digit reference used in the order guides.

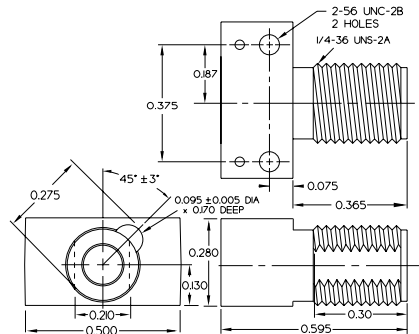
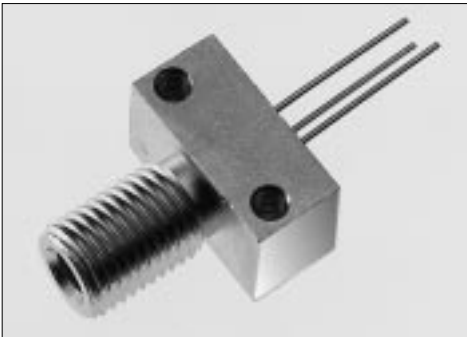
SMA SINGLE HOLE MOUNTING (REF.: AAA)



ST SINGLE HOLE MOUNTING (REF.: BAA)

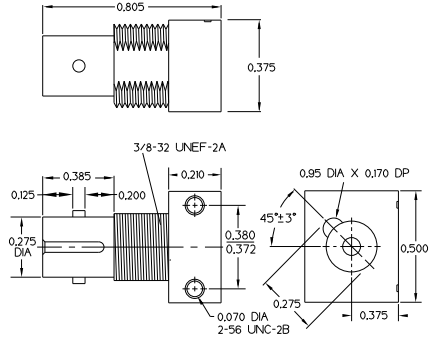


SMA PCB MOUNTING (REF.: ABA)



European Connectorized LEDs/Transmitters

ST PCB MOUNTING (REF.: BBA)



SMA 4 HOLE MOUNTING (REF.: ADA)

