

HFE4074-323/XXX

High Power Fiber Optic LED

FEATURES

- Provides 10 μ W into 50/125 micron fiber
- High speed up to 100 MHz typical
- Optimized for 50 mA operation
- 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 HFE4074-323/XXX is a high radiance GaAlAs 850 nanometer LED optimized for coupling into small fiber core diameters at a forward current of 50 mA. The "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 HFE4074-323/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 100 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. When high currents (near the 100 mA range) flow through the HFE4074-323/XXX continually, heat sinking is recommended to maintain the expected long life. If the HFE4074-323/XXX 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 HFE4074-323/XXX sends high optical power into standard fiber optic cables. A 0.25 mm diameter glass microlens over the "Caprock"[™] junction collimates the light, increasing the intensity, which directs greater power into standard fiber optic cables.

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

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HFE4074-323/XXX

High Power Fiber Optic LED

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

| PARAMETER | SYMBOL | MIN | TYP ⁽¹⁾ | MAX | UNITS | TEST CONDITIONS |
|--|---------------------|-------|--------------------|-------|-------|---|
| Fiber Coupled Power | P _{oc} | | | | | I _F = 50 mA, 50/125 micron, 0.20 NA fiber ⁽²⁾ |
| | HFE4074-323/XXX | 10 | 20 | 40 | μW | |
| | | -20.0 | -17.0 | -14.0 | dBm | |
| Forward Voltage | V _F | 1.5 | 1.84 | 2.28 | V | I _F = 50 mA |
| Reverse Voltage | B _{VR} | 1.8 | 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 | | | | | | 1 V Prebias, 100 mA peak ⁽³⁾ |
| 10-90% | t _R | | 3 | 6.3 | ns | |
| 90-10% | t _F | | 5 | 6.3 | ns | |
| Analog Bandwidth | BWE | | 100 | | MHz | I _F = 100 mA DC, sinusoidal modulation ⁽³⁾ |
| P _O Temperature Coefficient | ΔP _O /ΔT | | -0.02 | | dB/°C | I _F = 50 mA |
| Series Resistance | R _S | | 4.0 | | Ω | DC |
| Capacitance | C | | 35 | | pF | V _R = 0 V, f = 1 MHz |

Notes

- Typical specifications are for operations at T_C = 25°C.
- HFE4074-323/XXX is tested using a 50/125 micron fiber located in a special fixture. The fiber is mechanically centered with respect to the outside can diameter. Actual coupled power values may vary due to mechanical alignment procedures and/or receptacle and fiber tolerances.
- HFE4074-323/XXX must be heat sunked for continuous I_F > 50 mA operation (i.e. mounted in a metal connector with thermally conductive epoxy).

ABSOLUTE MAXIMUM RATINGS

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

| | |
|--|---------------|
| Storage temperature | -65 to +150°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 = 50mA

| Dia. | Index | N.A. | -323 |
|----------|--------|------|-----------|
| 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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High Power Fiber Optic LED

ORDER GUIDE

| Description | Catalog Listing |
|--|-----------------|
| Standard screening, minimum power out 10 μ W, $t_r/t_f < 6.5$ ns | HFE4074-323/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

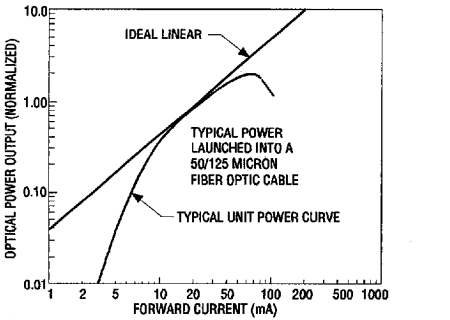


Fig. 2 Typical Spectral Output vs Wavelength

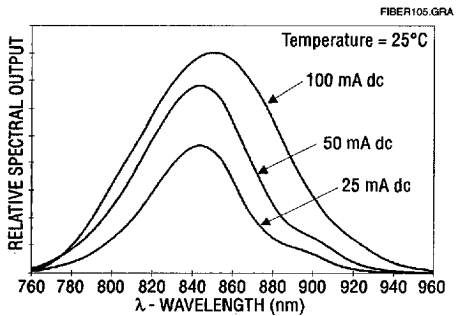
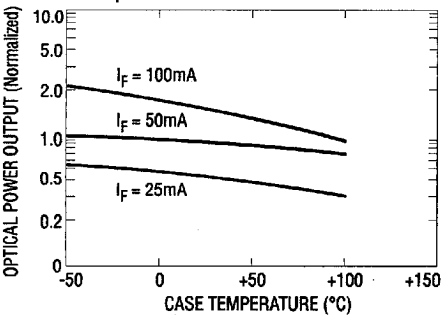


Fig. 3 Typical Optical Power Output vs Case Temperature



All Performance Curves Show Typical Values

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