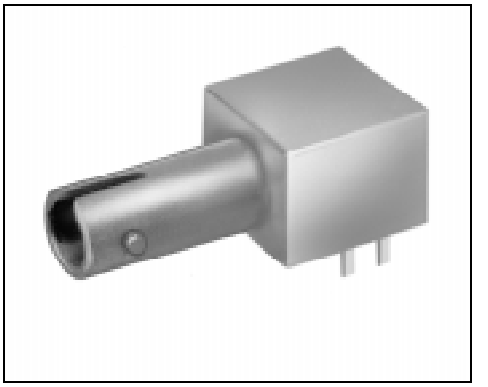
# HFE4225

## Next Generation High Power LEDs, Plastic ST Package

**FEATURES**

- Industry standard ST® fiber connector
- 850 nm GaAlAs LED
- Fiber Dip package style
- High reliability construction
- Straight plastic barrel and housing
- Wave solderable



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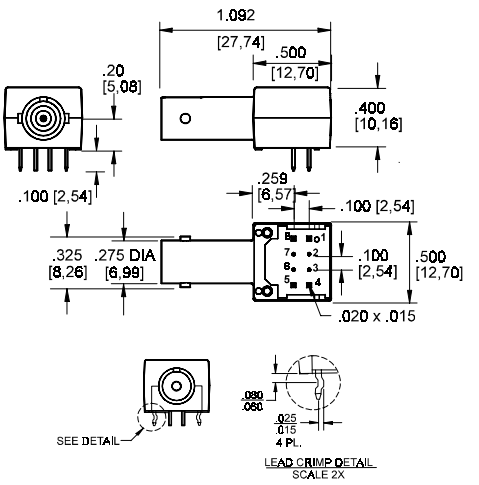
**DESCRIPTION**

Next Generation LEDs are designed for use in IEEE 802.3 Ethernet and IEEE 802.5J Token Ring applications such as repeaters, bridges, hubs, routers, switches and gateways. The devices are GaAlAs 850 nm LEDs which are designed to efficiently couple optical power into different fiber sizes ranging from 50/125 micron to 200/240 micron. They typically couple -12.0 dBm into 62.5/125 micron cable at 60 mA peak. The LED component is eletrically isolated from the connector barrel. The mechanical construction uses a high reliability ST Fiber-Dip fiber optic connector/housing designed to be easily mounted on printed circuit boards without the need for additional hardware. This component is specifically designed to provide performance and flexibility to the designer and should be driven with a 50% duty cycle at 60 mA to 100 mA peak forward current for the electrical input signal.

Next Generation LEDs have been updated and improved from existing Fiber Optic LEDs. The Next Generation LEDs provide an improved lensing scheme which makes the fiber optic coupling more repeatable. The LEDs are manufactured with an automated process that eliminates variable introduced by a manual process. The Next Generation LEDs are pin for pin compatible with existing Fiber Dip LEDs.

**OUTLINE DIMENSIONS in inches (mm)**

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**Pinout**

| | |
|---|---|
| 1. Common | 5. Common |
| 2. Anode | 6. Anode |
| 3. Cathode | 7. Anode |
| 4. Common | 8. Common |

Pin 1, 4, 5 & 8 are common.



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**ELECTRO-OPTICAL CHARACTERISTICS** ($T_A$ = -40 to +85°C unless otherwise specified)

| PARAMETER | SYMBOL | MIN | TYP (1) | MAX | UNITS | TEST CONDITIONS |
|---|---|---|---|---|---|---|
| Fiber Coupled Powe (HFE4225-X22) | $P_{OC}$ | | | | dBm | $I_F$=100 mA Peak 50/125µm |
| Peak, $T_A$=25°C | | -17.3 | -13.8 | -11.4 | | fiber, NA = 0.20 |
| Peak over temp. | | -18.9 | | -10.8 | | |
| Fiber Coupled Power (2) | $P_{OC}$ | | | | dBm | $I_F$ = 60 mA Peak 50/125 µm |
| Peak, $T_A$=25°C | | -18.8 | -15.8 | -13.8 | | fiber, NA = 0.20 |
| Peak over temp. | | -19.8 | | -12.8 | | |
| Fiber Coupled Power (2) | $P_{OC}$ | | | | dBm | $I_F$ = 100 mA Peak 62.5/125 µm |
| Peak, $T_A$=25°C | | -13.5 | -10.0 | -7.6 | | fiber, NA = 0.275 |
| Peak over temp. | | -15.1 | | -7.0 | | |
| Fiber Coupled Power (2) | $P_{OC}$ | | | | dBm | $I_F$ = 60 mA Peak 62.5/125 µm |
| Peak, $T_A$=25°C | | -15.0 | -12.0 | -10.0 | | fiber, NA = 0.275 |
| Peak over temp. | | -16.0 | | -9.0 | | |
| Fiber Coupled Powe (HFE4225-X23) | $P_{OC}$ | | | | dBm | $I_F$ = 60 mA Peak 62.5/125 µm |
| Peak, $T_A$=25°C | | -15.0 | -10.5 | -9.0 | | fiber, NA = 0.275 |
| Peak over temp. | | -16.0 | | -8.0 | | |
| Forward Voltage | $V_F$ | | 1.84 | | V | $I_F$ = 100 mA |
| | $V_F$ | 1.48 | 1.70 | 2.09 | V | $I_F$ = 60 mA |
| Forward Voltage Temperature | $\Delta V_F/\Delta T$ | | -0.18 | | mV/°C | $I_F$ = 100 mA |
| Coefficient | $\Delta V_F/\Delta T$ | | -0.22 | | mV/°C | $I_F$ = 60 mA |
| Reverse Voltage | $B_{VR}$ | 1.8 | 3.8 | | V | $I_R$ = 10 µA |
| Peak Wavelength | $\lambda_P$ | 810 | 856 | 895 | nm | $I_F$ = 100 mA DC |
| | $\lambda_P$ | 810 | 850 | 885 | nm | $I_F$ = 60 mA DC |
| Spectral Bandwidth (FWHM) | | | 55 | | nm | $I_F$ = 100 mA DC |
| | | | 50 | | nm | $I_F$ = 60 mA DC |
| Response Time | $t_R/t_F$ | | 4.0 | 6.3 | ns | $I_F$ = 60 mA peak, No Prebias |
| $P_O$ Temperature Coefficient | $\Delta P_O/\Delta T$ | | -0.017 | | dB/°C | $I_F$ = 100 mA |
| | $\Delta P_O/\Delta T$ | | -0.006 | | dB/°C | $I_F$ = 60 mA |
| Series Resistance | $r_S$ | | 4.0 | | Ω | DC |
| Device Capacitance | C | | 40 | | pF | $V_R$ = 0 V, f = 1 MHz |
| Thermal Resistance | | | 260 | | °C/W | Heat sinked |

Notes

1. Typical specifications are for operations at $T_C$= 25°C.
2. $P_{OC}$ is measured using a 10 meter mode stripped cable which is intended to accurately represent a working system.

**ABSOLUTE MAXIMUM RATINGS**

| | |
|---|---|
| Storage temperature | -55 to +85°C |
| Case operating temperature | -40 to +85°C |
| Lead solder temperature | 269°C, 10 s |
| Reverse voltage | 1.8 V |
| Continuous forward current (heat sinked) | 100 mA |

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.



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**ORDER GUIDE**

| Description | Catalog Listing |
|---|---|
| Straight plastic barrel and housing, standard power | HFE4225-022 |
| Straight plastic barrel and housing, crimped leads, standard power | HFE4225-422 |
| Straight plastic barrel and housing, extended power | HFE4225-023 |
| Straight plastic barrel and housing, crimped leads, extended power | HFE4225-423 |

**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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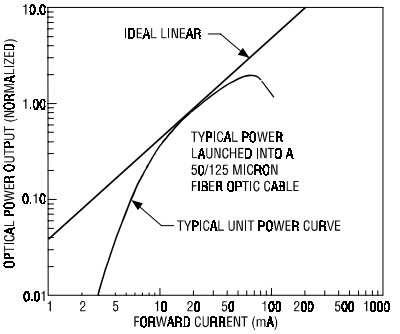


Fig. 2 Typical Spectral Output vs Wavelength

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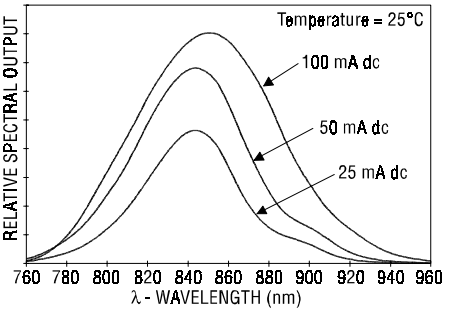


Fig. 3 Typical Optical Power Output vs Case Temperature

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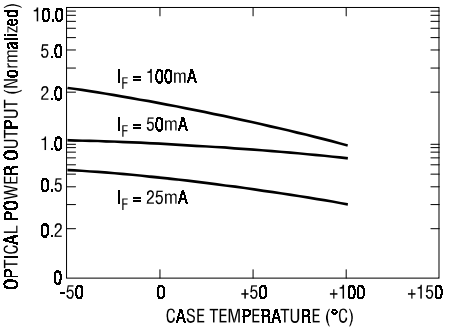


All Performance Curves Show Typical Values



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