
14 Pin DIL Uncooled Laser Modules

Technical Data

Features

- **Low Cost Plastic Package (14 Pin DIL)**
- **LSC3300: 100 μ W (-10 dBm) Min. Power Output**
LSC3100: 1 mW (0 dBm) Min. Power Output
- **1280 - 1330 nm Wavelength**
- **Hermetic Laser Module**
- **-40°C to +85°C Operation**

Applications

- **Telecommunications**
- **Local Area and Metropolitan Area Networks**
- **Point to Point Datacommunications**
- **Fiber Optic Sensors**
- **Cable Television**
- **Military Communications and Control Systems**
- **Instrumentation**

Description

LSC3X00 laser modules are high reliability fiber optic light sources operating in the 1300 nanometer band. They are particularly well suited for applications where low power dissipation is required.

The internal semiconductor lasers are based upon InGaAsP buried heterostructure (BH) technology and fabricated by the Metal-Organic Vapor Phase Epitaxy (MOVPE) process, resulting in long lifetimes and modest threshold currents.

The LSC3X00 package includes a photodiode for monitoring the laser output. A longhorn type heatsink mounting flange is incorporated in the industry standard 14 pin DIL package.

Two basic varieties are offered for alternative power ranges. The “low power” LSC3300 covers the power range between 100 μ W

LSC3X00



and 625 μ W. The “high power” LSC3100 uses the same laser chip, but with tighter fiber coupling to achieve output powers from 1 mW to 2.5 mW.

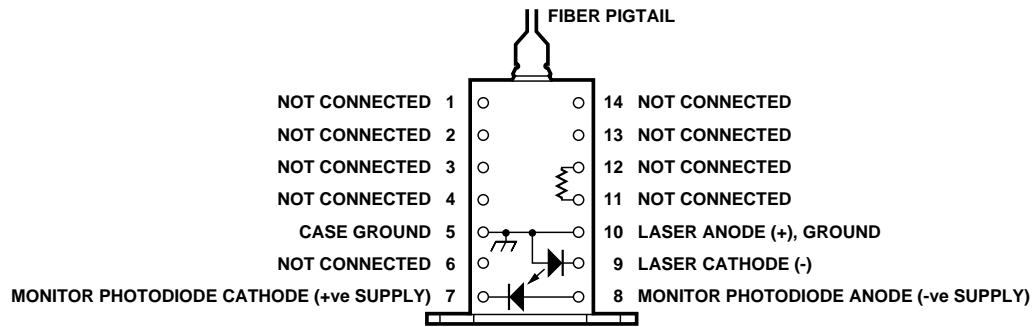
The low cost outer package is made feasible by our unique design of hermetic miniature laser submodule which houses the electro-optic devices. The submodule concept is used as a building block in many other Hewlett-Packard products including cooled 1 mW 14 pin lasers and DFB modules.

Laser Safety Warning

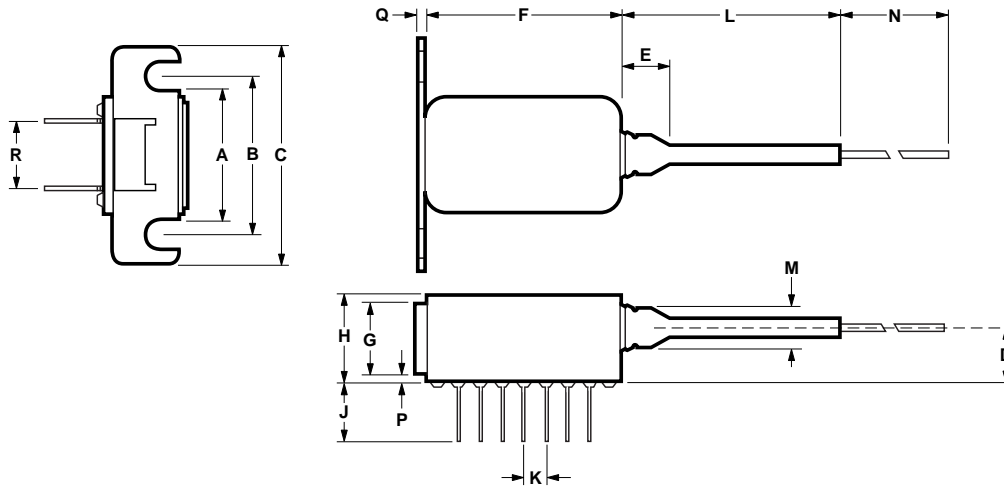
This device is a Class IIIb (3b) Laser Product. It may emit invisible laser radiation if operated with the fiber pigtail disconnected. To avoid possible eye damage do not look into an unconnected fiber pigtail during laser operation. Do not exceed specified operating limits.

LSC3X00 Pin Connections and Block Diagram

Top View



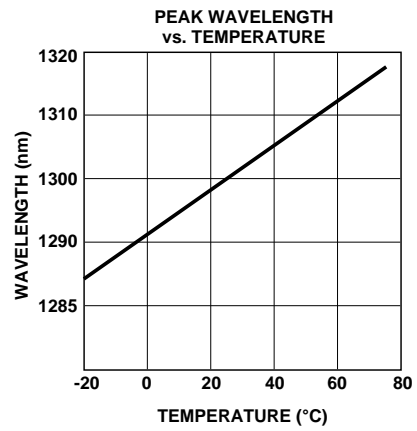
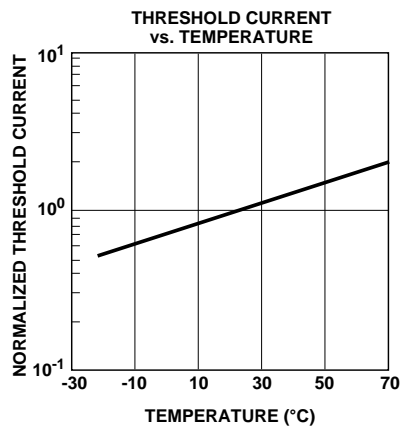
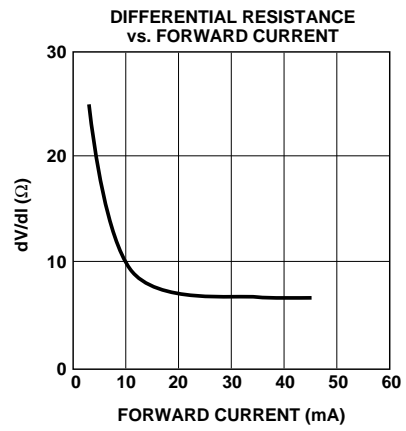
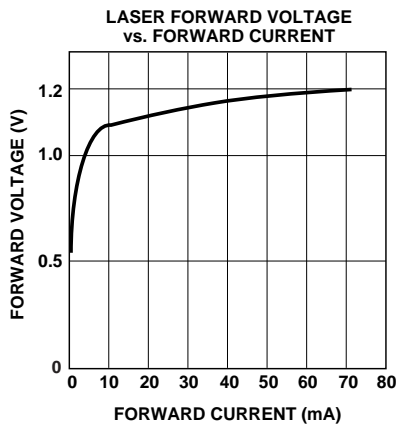
LSC3X00 Mechanical Outline - Dimensions in mm



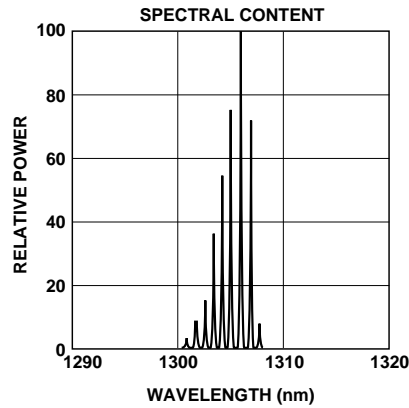
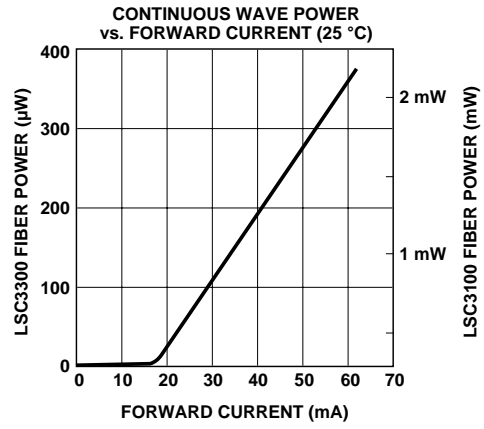
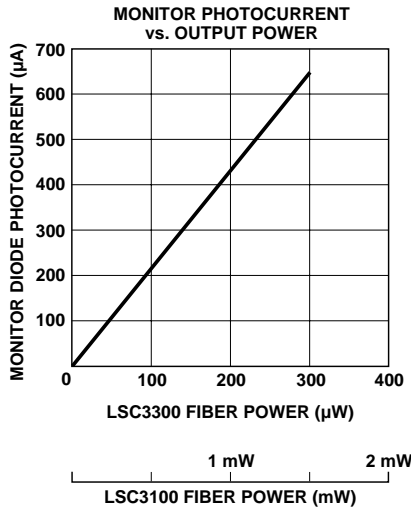
| DIM. | MIN. | MAX. | DIM. | MIN. | MAX. |
|------|------------|-------|------|-----------|------|
| A | 12.6 | 12.8 | J | 5.5 | 5.9 |
| B | 19.05 NOM. | | K | 2.52 NOM. | |
| C | 25.3 | 25.5 | L | 25.0 NOM. | |
| D | 6.4 | 6.8 | M | - | 4.2 |
| E | - | 6.0 | N | 800 | - |
| F | 21.33 | 21.53 | P | 1.5 | 1.8 |
| G | 7.01 | 7.21 | Q | 0.99 | 1.05 |
| H | 9.40 | 9.60 | R | 7.62 NOM. | |

ALL DIMENSIONS IN MILLIMETERS

LSC3X00 Laser Diode Typical Operating Characteristics



LSC3X00 Laser Diode Typical Operating Characteristics



Absolute Maximum Ratings

Absolute maximum limits mean that no catastrophic damage will occur if the product is subjected to these ratings for short periods, provided each limiting parameter is in isolation and all other parameters have values within the performance specification. It should not be assumed that limiting values of more than one parameter can be applied to the product at the same time.

| Parameter | Symbol | Conditions | Limits | | Units |
|----------------------------|--------|--|--------|----------------|-------|
| | | | Min. | Max. | |
| Laser Forward Current | If | DC | - | 150 | mA |
| Laser Reverse Current | Ir | DC | - | 100 | μA |
| Laser Reverse Voltage | Vlr | DC | - | 2 | V |
| Photodiode Reverse Voltage | Vr | DC | - | 10 | V |
| Photodiode Forward Current | Ipf | DC | - | 1 | mA |
| Operating Temperature | Tc | Pf min. | -40 | +85 | °C |
| Storage Temperature | Ts | | -40 | +85 | °C |
| Relative Humidity | RH | | 0.0 | non-condensing | %RH |
| Fiber Pull Strength | | | - | 10 | N |
| Mechanical Shock | | Mil Std 883D, Method 2002, Condition B | | | |
| Vibration | | Mil Std 883D, Method 2007, Condition A | | | |

Performance Specifications

| Parameter | Symbol | Conditions | LSC3300 | | LSC3100 | | Units |
|-----------------------------|--------|---|---------|------|---------|------|-------|
| | | | Min. | Max. | Min. | Max. | |
| LASER | | CW, Tc = 25°C, Pf = Pf min. unless otherwise stated | | | | | |
| Threshold Current | Ith | | 5 | 35 | 5 | 35 | mA |
| Peak Optical Output Power | Pf | | 100 | - | 1000 | - | μW |
| Optical Output Power | Pth | Pth = Pf @ Ith -2 mA | - | 10 | - | 50 | μW |
| Slope Efficiency | η | | 4 | 16 | 40 | 100 | μW/mA |
| Forward Voltage | Vf | | - | 1.8 | - | 1.8 | V |
| Differential Resistance | Rd | dV/dI | - | 10 | - | 10 | Ω |
| Centre Wavelength | λc | Note 1 | 1280 | 1330 | 1280 | 1330 | nm |
| Ic Change with Temperature | Δλ/ΔT | Tc = -40°C to 85°C | - | 0.5 | - | 0.5 | nm/°C |
| Linewidth | Δλ | FWHM (2.35s) | - | 5 | - | 5 | nm |
| Rise Time | τr | 10% to 90%: Ith to Pf = Pf min. | - | 0.5 | - | 0.5 | ns |
| Fall Time | τf | 90% to 10%: Pf = Pf min. to Ith | - | 0.5 | - | 0.5 | ns |
| Small Signal Freq. Response | Bw | Pf = Pf min., ± 3 dB | 1.0 | - | 1.0 | - | GHz |

Note:

1. Modulated measurement available.

If the specific performance you require is not met by the above parameters, please contact Hewlett-Packard as the submodule designs allows customization of performance to meet your needs.

Performance Specifications (cont'd.)

| Parameter | Symbol | Test Conditions | LSC3300 | | LSC3100 | | Units |
|--------------------|--------|--|---------|------|---------|------|-------|
| | | | Min. | Max. | Min. | Max. | |
| MONITOR PHOTODIODE | | Tc = 25°C, Vr = -5 V, (Note 2), CW, Pf = Pf min. unless otherwise stated | | | | | |
| Photocurrent | Im | | 25 | 800 | 50 | 800 | μA |
| Responsivity | R | | 0.25 | 8.0 | 0.05 | 0.8 | A/W |
| Dark Current | Id | If = 0 mA | - | 20 | - | 20 | nA |
| Tracking Error | ΔR | Im = Im @ (Pf = Pf min., Tc = 25°C) Tc = -40°C to +85°C | -1.5 | +1.5 | -2.0 | +1.5 | dB |

Note:

2. Photodiode will also operate under zero bias conditions.

Fiber Pigtail: Tight jacketed, self-mode stripping, single mode fiber

| Parameter | Minimum | Maximum | Units |
|-----------------------------|---------|---------|-------|
| Length | 1.0 | - | m |
| Spot Size (Mode Radius) | 4.5 | 5.5 | μm |
| Cladding Diameter | 122 | 128 | μm |
| Core/Cladding Concentricity | - | 1.0 | μm |
| Secondary Jacket Diameter | 0.8 | 1.0 | mm |
| Effective Cutoff Wavelength | 1150 | 1240 | nm |

Hewlett-Packard can offer a ruggedized fiber pigtail for this product range if extreme mechanical strength is required. The pigtail length can be customized to your specific length, with a connector, to a tolerance of ±25 mm.

Ordering Information

LSC3X00 - XX

Connectors:
FP = FC/PC Polish
ST = ST®
BI = Biconic
SA = SMA
SC = SC
DN = DIN
SF = Super Polish FC/PC

Power Range:
1 = 1 mW minimum
3 = 100 μ W minimum

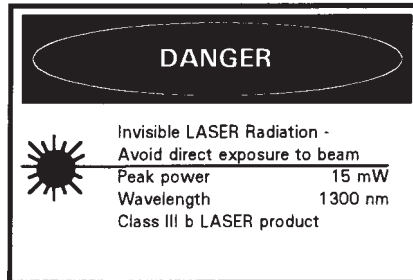
CDRH Certification

Hewlett-Packard Ltd
Whitehouse Road
Ipswich, Suffolk IP1 5PB
England

Manufactured: ____ Serial No. ____
Model No. _____

This product conforms to the applicable requirements of 21 CFR 1040 at the date of manufacture.

Laser Warning



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