

# ML1220

1550 nm FP Laser Diode in 5.6 mm TO-can

## Overview

Modulight's ML1220 series are high-performance Fabry-Pérot (FP) laser diodes in 5.6 mm TO-cans. The lasers emit single transverse mode at 1550 nm wavelength. The can package includes an InGaAs monitor photodiode for feedback loop.

ML1220 series is designed for digital optical communication networks with up to 2.5 Gb/s modulation speeds. Products are available with flat window cap, with ball lens cap or with low-profile aspheric lens cap for highest single-mode fiber coupling efficiency.



## Applications

### Communications

Digital optical communication networks

## Electro-optical Characteristics <sup>1</sup>

Parameter	Symbol	Min	Typical	Max	Unit
Peak Wavelength ( $P_{OP} = 5mW$ )	$\lambda$	1530	1550	1570	nm
Peak Wavelength ( $P_{OP} = 5mW$ )	$\lambda$	1485	-	1610	nm
Rated Optical Power (kink-free)	$P_R$	5	-	-	mW
Operating Current (25°C, $P_{OP} = 5mW$ )	$I_{OP}$	-	28 [30]	35 [42]	mA
Operating Current (85°C, $P_{OP} = 5mW$ )	$I_{OP,85}$	-	48 [52]	-	mA
Operating Voltage ( $P_{OP} = 5mW$ )	$V_{OP}$	-	1.15	1.5	V
Slope Efficiency (25°C, $P_{OP} = 5mW$ )	$\eta$	0.22 [0.2]	0.29 [0.25]	-	W/A
Slope Efficiency <sup>2</sup> (85°C, $P_{OP} = 5mW$ )	$\eta$	-	0.19 [0.16]	-	W/A
Serial resistance (25°C, $P_{OP} = 5mW$ )	$R_s$	-	8	-	$\Omega$
Threshold Current <sup>2</sup>	$I_{TH}$	-	10	15	mA
Threshold Current <sup>2</sup> (85°C)	$I_{TH,85}$	-	23	-	mA
Spectral Width <sup>3</sup>	$\delta\lambda$	-	1.3	2.5	nm
Wavelength - Temp. Coefficient	$\Delta\lambda/\Delta T$	-	0.46	-	nm/K
Parallel Beam Divergence (FWHM)	$\theta_{  }$	-	23 [6] (-)	-	°
Perpendicular Beam Divergence (FWHM)	$\theta_{\perp}$	-	44 [13] (-)	-	°
Modulation Bandwidth (kink-free)	$f_{-3dB}$	-	2	-	GHz
Monitor current	$I_m$	100	-	1000	$\mu A$
Monitor dark current	$I_d$	-	0.1	1.0	$\mu A$
Monitor capacitance	$C_m$	-	5	10	pF
Tracking error ( $I_m = \text{constant}$ , $P_o = 3mW @ 25^\circ C$ )	$\gamma$	-1	-	1	db
Focal length <sup>4</sup>	$D_f$	-	[6.25] (7.52)	-	mm
Fiber coupling efficiency (SM fiber)		-	[10.3] (40)	-	%

Unless otherwise noted, the above values represent operation @ 25°C. All temperatures refer to case temperature,  $T_c$ .

<sup>1</sup> Where indicated, values in brackets [ ] apply for ball lens cap type, values in parenthesis ( ) apply for aspheric lens cap type

<sup>2</sup> 2<sup>nd</sup> derivative method

<sup>3</sup> RMS, -20 dB

<sup>4</sup> Distance from the reference plane (see mechanical specification) to focal point. Applicable to ball and aspheric lens cap types only.

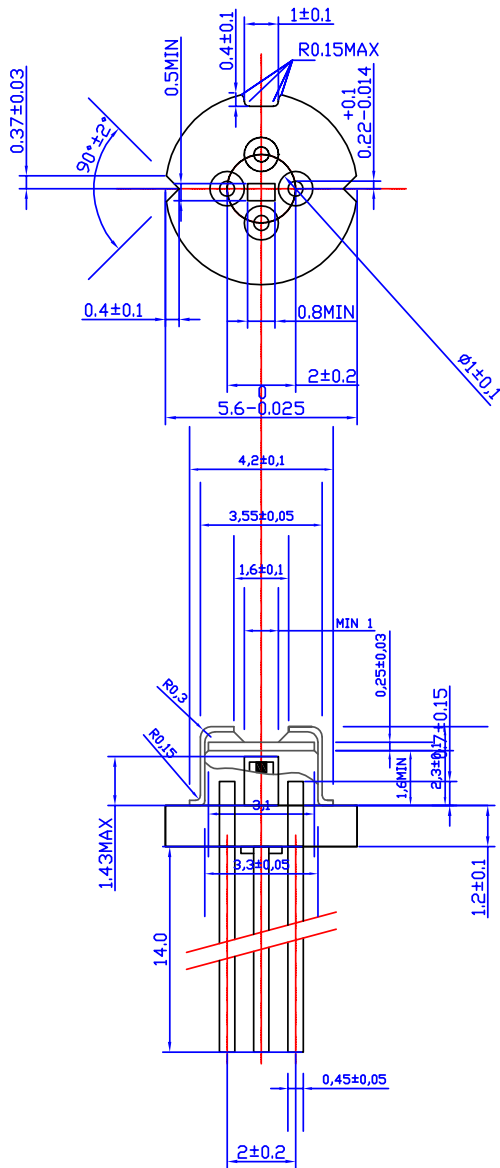
### Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Optical Output Power	P <sub>OP</sub>	20	mW
LD Reverse Voltage	V <sub>RLD</sub>	2	V
LD Forward Current	I <sub>FLD</sub>	200	mA
PD reverse voltage	V <sub>RPD</sub>	20	V
PD forward current	I <sub>FPD</sub>	10	mA
Lead soldering temperature (<10 s)	T <sub>SLD</sub>	260	°C
Operating case temperature	T <sub>c</sub>	-40-85°C	°C
Storage temperature	T <sub>STG</sub>	-40-85°C	°C

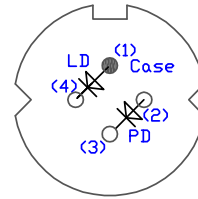
### Ordering information

Product	Cap type	Pin layout
ML1220	Aspherical lens	3
ML1221	Ball lens	3
ML1222	Flat lens	3
ML1262	Aspherical lens	1
ML1263	Aspherical lens	2
ML1264	Ball lens	1
ML1265	Ball lens	2
ML1266	Flat lens	1
ML1267	Flat lens	2

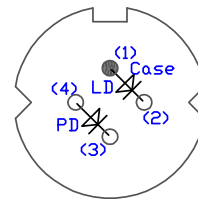
Mechanical Specification ML1222, ML1266, ML1267



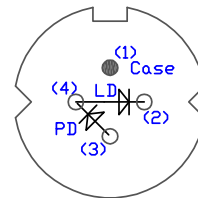
Bottom view  
pin layout



Pin layout 1

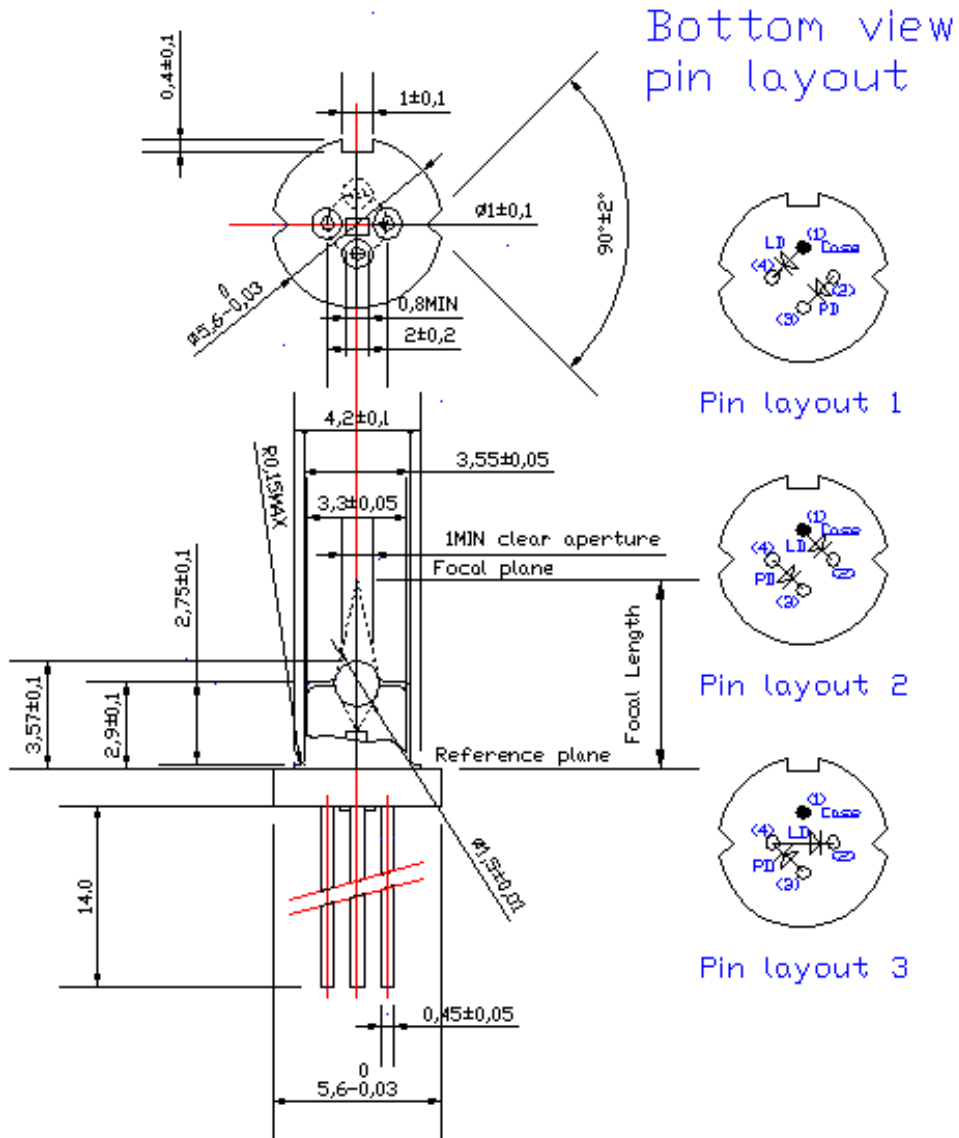


Pin layout 2

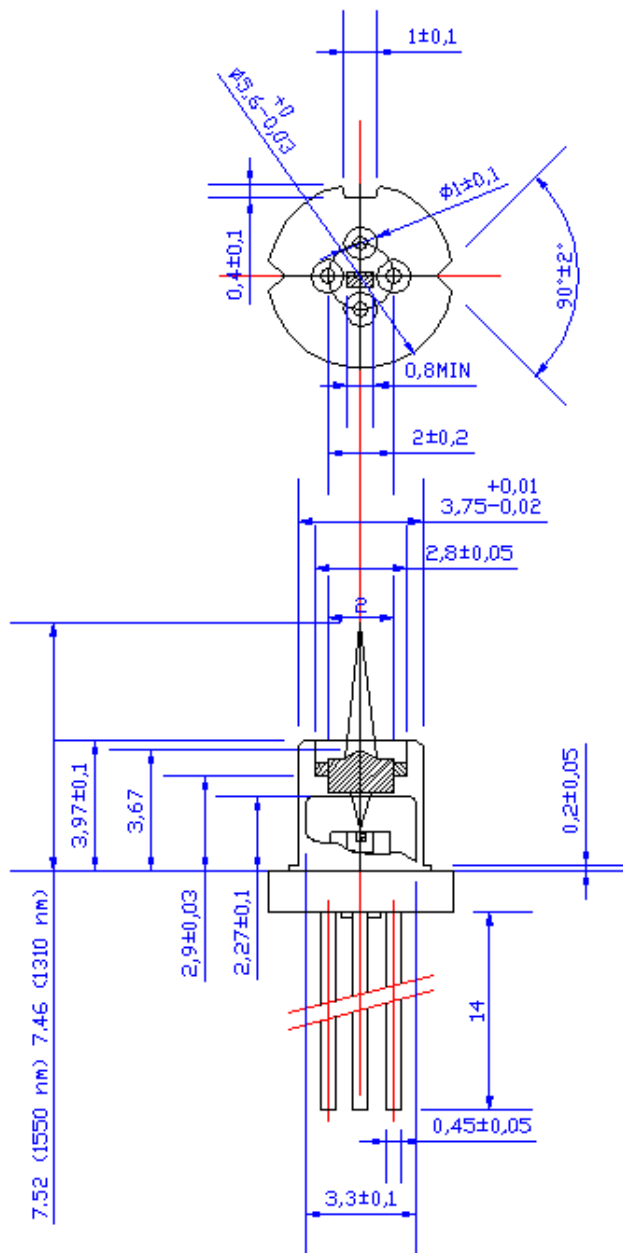


Pin layout 3

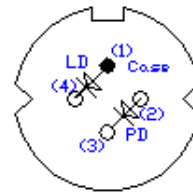
Mechanical Specification ML1221, ML1264, ML1265



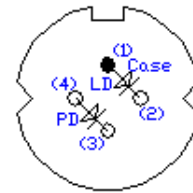
Mechanical Specification ML1220, ML1262, ML1263



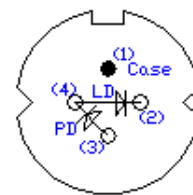
Bottom view  
pin layout



Pin layout 1



Pin layout 2



Pin layout 3

### Safety Information

- The laser light emitted from this laser device is invisible and potentially harmful to the human eye. Avoid eye and skin exposure to the beam, both direct and reflected.
- Products are subject to the risks normally associated with sensitive electronic devices including static discharge, transients, and overload. Please ensure ESD protection prior to handling the products.
- These Modulight products are not intended for use in systems where product malfunction can reasonably be expected to result in personal injury.



### Liability note

This document is sole property of Modulight, Inc. No part of this document may be copied without written acceptance of Modulight, Inc. All statements related to the products herein are believed to be reliable and accurate. However, the accuracy is not guaranteed and no responsibility is assumed for any inaccuracies or omissions. Modulight, Inc. reserves the right to make changes in the specifications at any time without prior notice.