



**Modulight, Inc.**

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ML1220 SERIES TECHNICAL SPECIFICATION				
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# TECHNICAL SPECIFICATION

## ML1220

## 1 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 have been 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.

## 2 ORDERING INFORMATION

Sales part	Cap type	Pin layout <sup>1)2)</sup>
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

## 3 ELECTRO-OPTICAL CHARACTERISTICS<sup>1, 2</sup>

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Rated optical power <sup>3</sup>	$P_R$	5	-	-	mW	-40-85°C
Threshold current <sup>4</sup>	$I_{th}$	-	10	15	mA	25°C
		-	23	-		85°C
Operating current	$I_{op}$	-	28 [30]	35 [42]	mA	25°C, $P_{op} = 5$ mW
		-	48 [52]	-		85°C, $P_{op} = 5$ mW
Operating voltage	$V_{op}$	-	1.15	1.5	V	-40-85°C, $P_{op} = 5$ mW
Serial resistance <sup>5</sup>	$R_s$	-	8	-	$\Omega$	25°C, $P_{op} = 5$ mW
Slope efficiency <sup>5</sup>	$\eta$	0.22 [0.2]	0.29 [0.25]	-	W/A	25°C, $P_{op} = 5$ mW
		-	0.19 [0.16]	-		85°C, $P_{op} = 5$ mW
Central wavelength	$\lambda_c$	1530	1550	1570	nm	25°C, $P_{op} = 5$ mW
		1485	-	1610		-40-85°C, $P_{op} = 5$ mW
Spectral width <sup>6</sup>	$\Delta\lambda$	-	1.3	2.5	nm	25°C, $P_{op} = 5$ mW
Temperature shift of wavelength	$\partial\lambda/\partial T$	-	0.65	-	nm/K	-40-85°C, $P_{op} = 5$ mW
Perpendicular beam divergence	$\theta_{\perp}$	-	44	-	deg	25°C, $P_{op} = 5$ mW

<sup>1</sup> All temperatures refer to case temperature,  $T_c$ .

<sup>2</sup> Where indicated, values in brackets [ ] apply for ball lens cap type, values in parenthesis ( ) apply for aspheric lens cap type

<sup>3</sup> Kink-free, demonstrated reliability

<sup>4</sup> 2<sup>nd</sup> derivative method

<sup>5</sup>  $P_{HI} = 1$  mW,  $P_{LO} = 7$  mW

<sup>6</sup> RMS, -20 dB



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angle (FWHM) <sup>7</sup>			[10] (-)			
Parallel beam divergence angle (FWHM) <sup>7</sup>	$\theta_l$	-	23 [10] (-)	-	deg	25°C, P <sub>op</sub> = 5 mW
Modulation bandwidth	f <sub>-3dB</sub>	6	-	-	GHz	25°C, I <sub>op</sub> = I <sub>th</sub> + 16 mA
		4	-	-		85°C, I <sub>op</sub> = I <sub>th</sub> + 16 mA
Monitor current	I <sub>m</sub>	150 [200]	300 [400]	600 [700]	μA	25°C, P <sub>op</sub> = 5 mW
Monitor dark current	I <sub>d</sub>	-	0.1	1.0	μA	25°C, V <sub>RPD</sub> = 5 V
Monitor capacitance	C <sub>m</sub>	-	5	10	pF	f = 1 MHz, V <sub>RPD</sub> = 5 V
Tracking error	γ	-1	-	1	dB	I <sub>m</sub> = constant, P <sub>o</sub> = 5mW@25°C
Focal length <sup>8</sup>	D <sub>f</sub>	-	[5.87] (3.60)	-	mm	25°C, P <sub>op</sub> = 5 mW
Fiber coupling efficiency		-	[10.3] (40)	-	%	Single-mode fiber

#### 4 ABSOLUTE MAXIMUM RATINGS<sup>9</sup>

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

<sup>7</sup> Full Width at Half Maximum

<sup>8</sup> Distance from reference plane (see mechanical specification) to focal point. Applicable to ball lens cap type only.

<sup>9</sup> Operation in excess of any one of these parameters may result in permanent damage.



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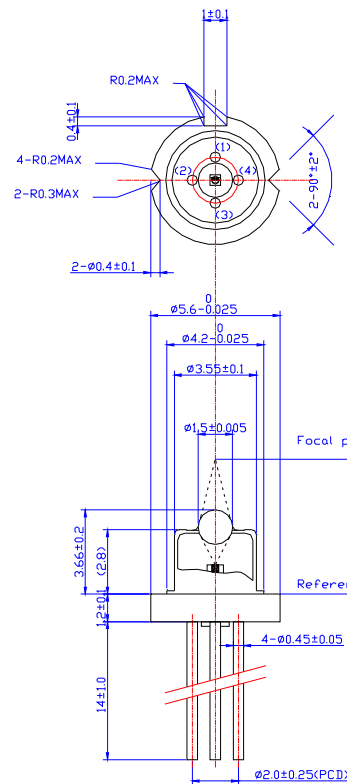
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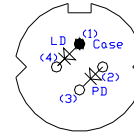
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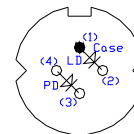
## 6 MECHANICAL SPECIFICATION - ML-T-1550-FP-2G5-5-B-X



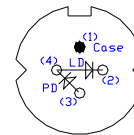
Bottom view  
pin layout



Pin layout 1



Pin layout 2



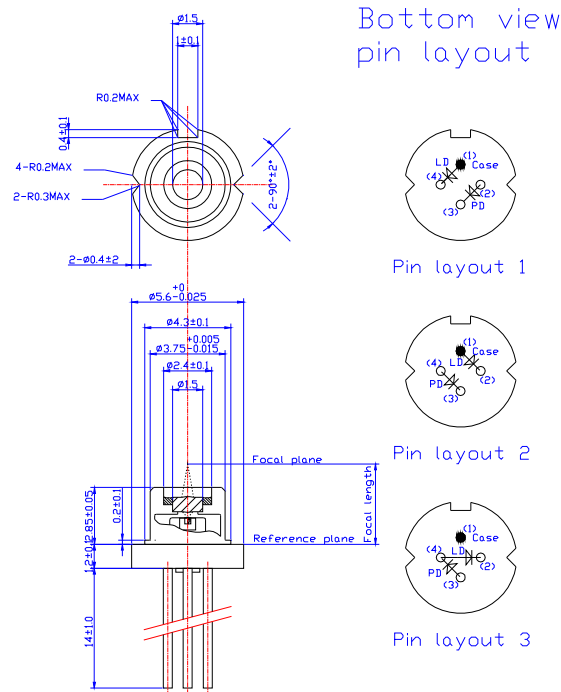
Pin layout 3



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## 7 MECHANICAL SPECIFICATION – ML-T-1550-FP-2G5-5-A-X



## 8 SAFETY INFORMATION

- The laser light emitted from this laser diode is invisible and may be harmful to the human eye. Avoid eye 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 take care of proper 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.



Peak power and wavelength are for safety analysis only do not present device performance



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