



Modulight, Inc.

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ML1004 TECHNICAL SPECIFICATION				
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ML1004 TECHNICAL SPECIFICATION

1 OVERVIEW

Modulight's ML1004 is a high-performance bare die Fabry-Pérot (FP) laser diode. The lasers emit single transverse mode at 1430 nm wavelength.

2 ORDERING INFORMATION

ML1004

3 ELECTRO-OPTICAL CHARACTERISTICS ¹

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Rated optical power ²	P_R	3	-	-	mW	-40-60 °C
Threshold current ³	I_{th}	-	12	18	mA	25 °C
		-	19	33		60 °C
Operating current	I_{op}	-	21	40	mA	25 °C, $P_{op} = 3$ mW
		-	29	60		60 °C, $P_{op} = 3$ mW
Operating voltage	V_{op}	-	1.1	1.6	V	25 °C, $P_{op} = 3$ mW
Serial resistance ⁴	R_s	-	6	-	Ω	25 °C, $P_{op} = 3$ mW
Slope efficiency ⁴	η	0.16	0.32	-	W/A	25 °C, $P_{op} = 3$ mW
		0.12	0.29	-		60 °C, $P_{op} = 3$ mW
Central wavelength	λ_c	1420	1430	1450	nm	25 °C, $P_{op} = 3$ mW
		1400	-	1470		-40-60 °C, $P_{op} = 3$ mW
Spectral width ⁵	$\Delta\lambda$	-	0.9	4	nm	25 °C, $P_{op} = 3$ mW
Temperature shift of wavelength	$\partial\lambda/\partial T$	-	0.50	-	nm/K	-40-60 °C, $P_{op} = 3$ mW
Perpendicular beam divergence angle (FWHM) ⁶	θ_{\perp}	-	36	-	deg	25 °C, $P_{op} = 3$ mW
Parallel beam divergence angle (FWHM) ⁶	θ_{\parallel}	-	21	-	deg	25 °C, $P_{op} = 3$ mW
Modulation bandwidth	f_{-3dB}	4	7	-	GHz	25 °C, $I_{op} = I_{th} + 16$ mA
		2	6	-		60 °C, $I_{op} = I_{th} + 16$ mA
Resonance frequency	f_r	-	5	-	GHz	25 °C, $I_{op} = I_{th} + 16$ mA
		-	4	-		60 °C, $I_{op} = I_{th} + 16$ mA

4 ABSOLUTE MAXIMUM RATINGS ⁷

Parameter	Symbol	Rating	Unit
Optical output power	P_{op}	20	mW
LD reverse voltage	V_{RLD}	2	V
LD forward current	I_{FLD}	150	mA
PD reverse voltage	V_{RPD}	20	V
PD forward current	I_{FPD}	10	mA
Lead soldering temperature (<10 s)	T_{SLD}	260	°C
Operating case temperature	T_c	-40-60 °C	°C
Storage temperature	T_{STG}	-40-85 °C	°C

¹ All temperatures refer to case temperature, T_c

² Kink-free, demonstrated reliability

³ 1st derivative method

⁴ $P_{HI} = 1$ mW, $P_{LO} = 3$ mW

⁵ RMS, -20 dB

⁶ Full Width at Half Maximum

⁷ Operation in excess of any one of these parameters may result in permanent damage.



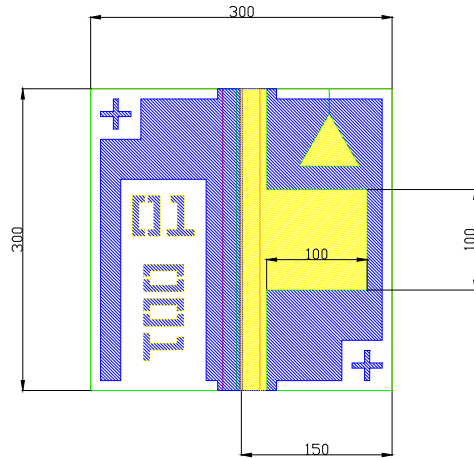
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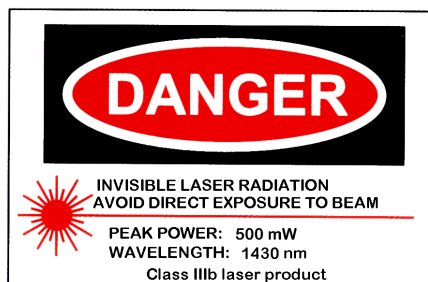
5 CHIP LAYOUT



All dimensions in microns.
 Chip thickness $100\ \mu\text{m} \pm 10\ \mu\text{m}$.
 Polarity: p-contact (anode) up.
 Top and bottom outer metal: 300 nm Au.

6 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

7 LIABILITY NOTE

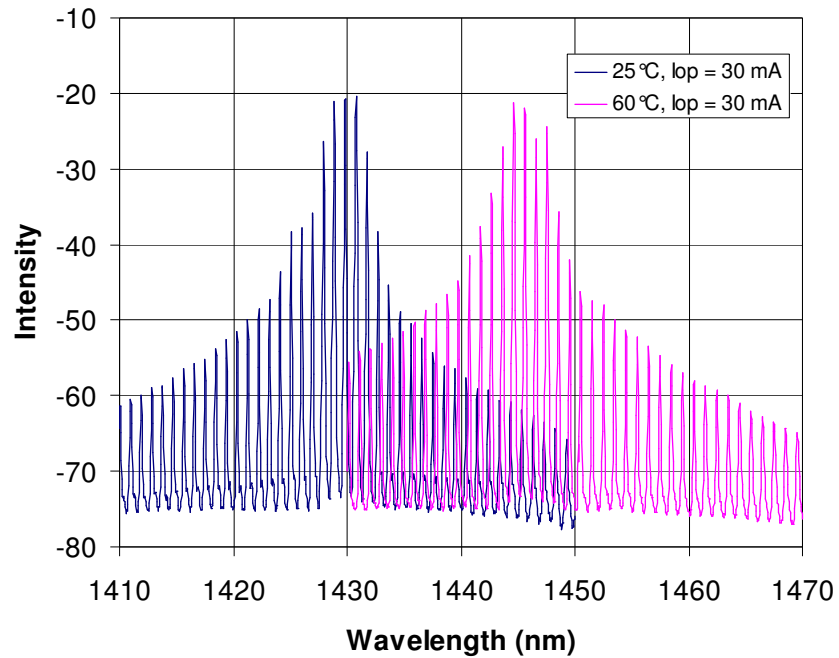
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8 TYPICAL PERFORMANCE



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