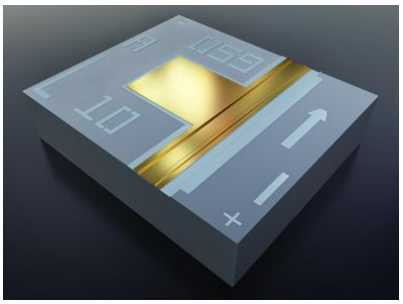
ML1004

1430 nm DFB Laser Diode for up to 1.25 Gb/s

Overview

Modulight's ML1004 is a high-performance Fabry-Pérot (FP) laser diode chip. The bare die laser emits at 1430 nm wavelength. ML1004 is designed for digital optical communication networks with up to 1.25 Gb/s modulation speeds.



Applications

Communications

Digital optical communication networks

Electro-optical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit
Central Wavelength (P_{OP} = 3mW)	λ	1420	1430	1450	nm
Central Wavelength [1] (P_{OP} = 3mW)	$\lambda_{-40...60}$	1400	-	1470	nm
Rated Output Power (kink-free) [1]	P_R	3	-	-	mW
Operating Current (P_{OP} = 3mW)	I_{OP}	-	21	40	mA
Operating Current (60°C, P_{OP} = 3mW)	$I_{OP,60}$	-	29	60	mA
Operating Voltage [1] (P_{OP} = 3mW)	V_{OP}	-	1.1	1.6	V
Slope Efficiency	η	0.16	0.32	-	W/A
Slope Efficiency (60°C)	η_{60}	0.12	0.29	-	
Threshold Current [2]	I_{TH}	-	12	18	mA
Threshold Current [2] (60°C)	$I_{TH,60}$	-	19	33	mA
Spectral Width [3]	$\delta\lambda$	-	0.9	4	nm
Wavelength - Temp. Coefficient [1]	$\Delta\lambda/\Delta T$	-	0.50	-	nm/K
Parallel Beam Divergence (FWHM)	$\theta \parallel$	-	36	-	°
Perpendicular Beam Divergence (FWHM)	$\theta\perp$	-	21	-	°
Modulation Bandwidth [5]	f_{-3dB}	4	7	-	GHz
Modulation Bandwidth [5] (60°C)	$f_{-3dB,60}$	2	6	-	GHz
Resonance Frequency	f_r	-	5	-	GHz
Resonance Frequency [5] (60°C)	$f_{r,60}$	-	4	-	GHz

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

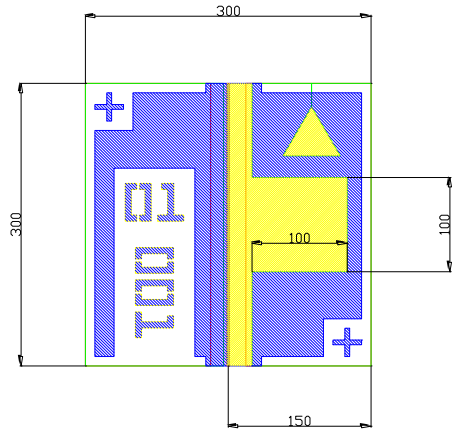
[1] -40…60°C, P_{OP} = 3 mW
[2] Half maximum of the 1st derivative method
[3] RMS, -20 dB
[4] –20 dB
[5] $I_{OP}=I_{TH}$ + 16 mA

Absolute Maximum Ratings

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 Temperature	T_{OP}	20…60 [1]	°C
Storage Temperature	T_{STG}	-40…85	°C

[1] A non-condensing environment should be ensured over the useful temperature range.

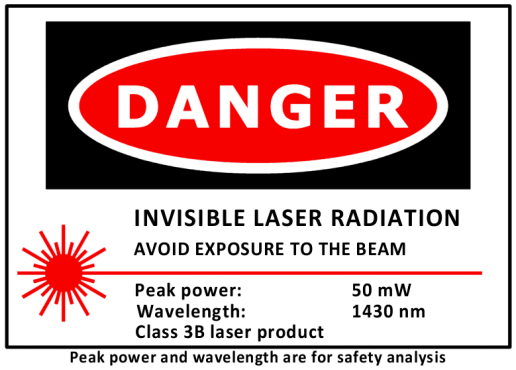
Mechanical Specification



Parameter	Symbol	Value	Unit
Cavity Length	L	300	µm
Chip Width	W	300	µm
Chip Thickness	H	100	µm
Top and bottomside outer Au metal layer	-	300	nm
Polarity	p-contact (anode) up		

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.



Peak power and wavelength are for safety analysis only, not to present device performance.

Liability note