



**Modulight, Inc.**

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ML1006 TECHNICAL SPECIFICATION				
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# TECHNICAL SPECIFICATION ML1006

## 1 OVERVIEW

Modulight's ML1006 is a high-performance Distributed Feedback (DFB) laser diode chip. The bare die laser emits at 1550 nm wavelength with 5 mW maximum rated power. Laser diode emission wavelength is controlled by an internal grating. ML1006 has been designed for digital optical communication networks with up to 3.125 Gb/s modulation speeds.

## 2 ORDERING INFORMATION

ML1006

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

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Rated optical power <sup>2</sup>	$P_R$	5	-	-	mW	25°C
		3	-	-		70°C
Threshold current <sup>3</sup>	$I_{th}$	-	15	30	mA	25°C
		-	-	50		70°C
Operating current	$I_{op}$	-	28	45	mA	25°C, $P_{op} = 5$ mW
		-	-	80		70°C, $P_{op} = 5$ mW
Operating voltage	$V_{op}$	-	1.2	1.9	V	20-70°C, $P_{op} = 5$ mW
Slope efficiency	$\eta$	0.18	0.3	-	W/A	25°C
Central wavelength	$\lambda_c$	1535	1550	1560	nm	25°C, $P_{op} = 5$ mW
		-	-	1565		20-70°C, $P_{op} = 5$ mW
Spectral width <sup>4</sup>	$\Delta\lambda$	-	0.1	0.3	nm	25°C, $P_{op} = 5$ mW
Side Mode Suppression Ratio <sup>5</sup>	SMSR	30	40	-	dB	20-70°C, $P_{op} = 5$ mW
Temperature shift of wavelength	$\partial\lambda/\partial T$	-	0.12	.	nm/K	20-70°C, $P_{op} = 5$ mW
Perpendicular beam divergence angle (FWHM) <sup>6</sup>	$\theta_{\perp}$	-	23	35	deg	25°C, $P_{op} = 5$ mW
Parallel beam divergence angle (FWHM) <sup>6</sup>	$\theta_{\parallel}$	-	40	50	deg	25°C, $P_{op} = 5$ mW
Modulation bandwidth	$f_{-3dB}$	6	-	-	GHz	25°C, $I_{op} = I_{th} + 16$ mA
		4	-	-		70°C, $I_{op} = I_{th} + 16$ mA

## 4 ABSOLUTE MAXIMUM RATINGS<sup>7</sup>

Parameter	Symbol	Rating	Unit
Optical output power	$P_{op}$	50	mW
LD reverse voltage	$V_{RLD}$	2	V
LD forward current	$I_{FLD}$	200	mA
Operating case temperature	$T_c$	20-70°C	°C
Storage temperature	$T_{STG}$	-40-85°C	°C

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

<sup>2</sup> Kink-free

<sup>3</sup> Half maximum of the 1<sup>st</sup> derivative method

<sup>4</sup> RMS, -20 dB

<sup>5</sup> -20 dB

<sup>6</sup> Full Width at Half Maximum

<sup>7</sup> Operation in excess of any one of these parameters may result in permanent damage.



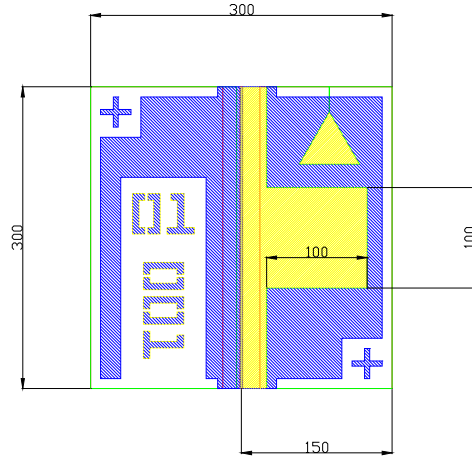
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## 5 CHIP LAYOUT – ML-C-1550-DFB-2G5



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.



## 7 LIABILITY NOTE

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