



Modulight, Inc.

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ML1217 SERIES TECHNICAL SPECIFICATION				
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TECHNICAL SPECIFICATION ML1217

1 OVERVIEW

Modulight's ML1217 series are high-performance Distributed Feedback (DFB) laser diodes in 5.6 mm TO-can. The lasers emit single longitudinal mode at 1490 nm wavelength. Laser diode emission wavelength is controlled by an internal grating. The can package includes an InGaAs monitor photodiode for feedback loop.

ML1217 series have been especially designed for digital optical communication in passive optical networks (PON) with up to 3.125 Gb/s modulation speeds. Products are available in two power variants with either a flat window cap or a specially designed low-profile cap with aspheric lens for higher single-mode fiber coupling efficiency and smaller footprint in demanding small form factor transceiver applications.

2 ORDERING INFORMATION

Sales part	Rated optical power (mW)	Cap type	Pin layout ¹⁾²⁾
ML1217	6	Aspherical lens	3
ML1218	6	Flat lens	2
ML1219	6	Flat lens	3
ML1253	10	Aspherical lens	1
ML1254	10	Aspherical lens	2
ML1255	10	Aspherical lens	3
ML1256	10	Flat lens	1
ML1257	10	Flat lens	2
ML1258	10	Flat lens	3
ML1259	6	Aspherical lens	1
ML1260	6	Aspherical lens	2
ML1261	6	Flat lens	1

3 ELECTRO-OPTICAL CHARACTERISTICS^{1, 2}

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Rated optical power ³	P_R	6/10	-	-	mW	0-70 °C
Threshold current ⁴	I_{th}	-	18	30	mA	25 °C
		-	35	-		70 °C
Operating current	I_{op}	-	38	50	mA	25 °C, $P_{op} = 5$ mW
		-	65	-		70 °C, $P_{op} = 5$ mW
Operating voltage	V_{op}	-	1.2	1.6	V	0-70 °C, $P_{op} = 5$ mW
Serial resistance ⁵	R_s	-	6	-	Ω	25 °C, $P_{op} = 5$ mW
Slope efficiency ⁵	η	0.17	0.26	-	W/A	25 °C, $P_{op} = 5$ mW
		-	0.16	-		70 °C, $P_{op} = 5$ mW

¹ All temperatures refer to case temperature, T_c

² Where indicated, values in paranthesis apply for aspheric lens cap type

³ Kink-free, demonstrated reliability

⁴ 2nd derivative method

⁵ $P_{HI} = 1$ mW, $P_{LO} = 7$ mW



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Central wavelength	λ_c	1487	1490	1493	nm	25 °C, $P_{op} = 5$ mW
		1482	-	1498		0-70 °C, $P_{op} = 5$ mW
Spectral width ⁶	$\Delta\lambda$	-	0.11	0.2	nm	25 °C, $P_{op} = 5$ mW
		-	0.07	0.2		70 °C, $P_{op} = 5$ mW
Side Mode Suppression Ratio ⁷	SMSR	30	40	-	dB	0-70 °C, $P_{op} = 5$ mW
Temperature shift of wavelength	$\partial\lambda/\partial T$	-	0.11	-	nm/K	0-70 °C, $P_{op} = 5$ mW
Perpendicular beam divergence angle (FWHM) ⁸	θ_{\perp}	-	45	-	deg	25 °C, $P_{op} = 5$ mW
Parallel beam divergence angle (FWHM) ⁸	θ_{\parallel}	-	26	-	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
Monitor current	I_m	40	100	700	μ A	25 °C, $P_{op} = 5$ mW
Monitor dark current	I_d	-	0.1	1.0	μ A	25 °C, $V_{RPD} = 5$ V
Monitor capacitance	C_m	-	5	10	pF	$f = 1$ MHz, $V_{RPD} = 5$ V
Tracking error	γ	-1	-	1	dB	$I_m = \text{constant}$, $P_o = 5\text{mW}@25^\circ\text{C}$
Focal length ⁹	D_f	(3.77)	(3.87)	(3.97)	mm	25 °C, $P_{op} = 5$ mW
Fiber coupling efficiency		-	(35)	-	%	25 °C, $P_{op} = 5$ mW, aspheric lens cap type

4 ABSOLUTE MAXIMUM RATINGS¹⁰

Parameter	Symbol	Rating	Unit
Optical output power	P_{op}	20	mW
LD reverse voltage	V_{RLD}	2	V
LD forward current	I_{FLD}	200	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	0-70 °C	°C
Storage temperature	T_{STG}	-40-85 °C	°C

⁶ RMS, -20 dB

⁷ -20 dB

⁸ Full Width at Half Maximum, applicable to flat window cap type only

⁹ Distance from reference plane (see mechanical specification) to focal point. Applicable to aspheric lens cap type only.

¹⁰ Operation in excess of any one of these parameters may result in permanent damage.



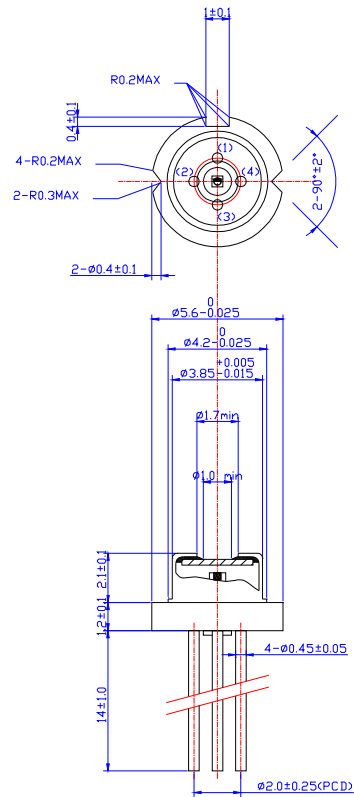
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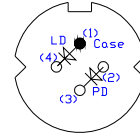
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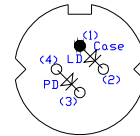
5 MECHANICAL SPECIFICATION – ML-T-1490-DFB-2G5-X-F-X



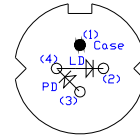
Bottom view
pin layout



Pin layout 1



Pin layout 2

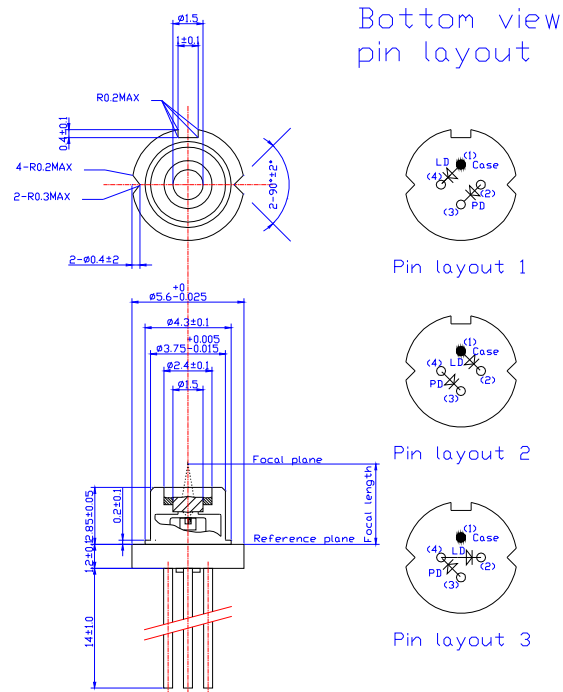


Pin layout 3



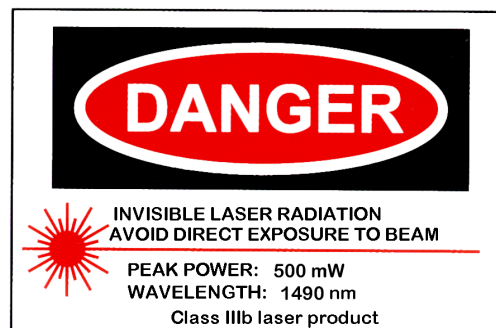
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6 MECHANICAL SPECIFICATION - ML-T-1490-DFB-2G5-X-A-X



7 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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8 LIABILITY NOTE

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