

LD4B-638-FP-10

OVERVIEW

Laser diode coupled to an optical fiber and packaged into a hermetic case.

MAIN FEATURES

- Wavelength: 638 nm
- Cavity type: Fabry-Perot
- Optical power in CW mode in single-mode fiber: 10 mW
- Package types: coaxial, coaxial with bracket, 14 pins DIL, 14 pins BTF
- Built-in monitor photodiode

ORDERING INFORMATION

LD4B-638-FP-10-X-X-X-X-X-X

Case type

COAX: compact coaxial (low duty cycle pulse mode only)

COAXB: compact coaxial with a bracket

TH: compact coaxial with a bracket compatible to Thorlabs mount

DIL: common 14-pins DIL for active thermal stabilization (TEC and thermistor)

DILRAD: 14-pins DIL for active thermal stabilization (TEC and thermistor) with wall radiator

BTF: 14-pins BTF type 1 (Pump) for active thermal stabilization (TEC and thermistor)

Pinout code

3: see more details on page 5

Fiber type

SM04: SM, [Coherent 630-HP](#), furcation tubing Ø0.9 mm

SMP04: PM, [Coherent PM630-HP](#), furcation tubing Ø0.9 mm

MM5: MM, [50/125_OM3](#), furcation tubing Ø0.9 mm

MM6: MM, [62.5/125_OM1](#), furcation tubing Ø0.9 mm

Other type on request

Connector type

FU: FC/UPC (SM04, SMP04)

FA: FC/APC (SM04, SMP04)

N: no connector (scissors cut)

Other type: on request

Test measurements

CW: CW mode (electro-optical parameters at T=25+/-5 C and spectrum)

P: Pulse mode (pulse duration 5 us, duty cycle 1%, at T=25+/-5 C)

CWP: both CW and pulse mode

Fiber length

0.5: 500+/-50 mm

1.0: 1000+/-100 mm

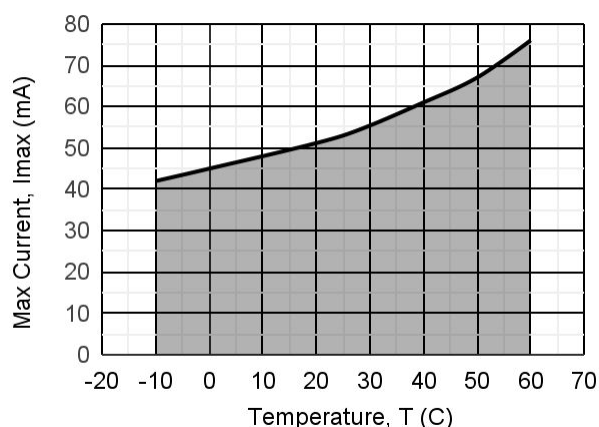
Other length on request

LD4B-638-FP-10

ABSOLUTE MAXIMUM RATINGS

Parameter		Value	Unit	Conditions
Laser diode forward current*	I_{max}	53	mA	CW, $T = 25^{\circ}\text{C}$
Laser diode forward current*	I_{pmax}	75	mA	Pulse, 5 μs , duty cycle 1%, $T = 25^{\circ}\text{C}$
Laser diode reverse voltage	V_{RL}	2	V	
Photodiode reverse voltage	V_{RP}	30	V	
Operating temperature**	T_{OP}	-10 - +60	$^{\circ}\text{C}$	Coaxial package
Operating temperature**	T_{OP}	-40 - +60	$^{\circ}\text{C}$	DIL, BTF ($T_{st} = 25^{\circ}\text{C}$)
Storage temperature	T_{stg}	-20 - +60	$^{\circ}\text{C}$	
Soldering temperature	T_{sld}	260	$^{\circ}\text{C}$	Max. 5 seconds

*Maximal laser diode forward current depends on the operating temperature. Please, refer to the figure below.



**Operating temperature is defined by the case temperature. It is recommended to ensure sufficient heat dissipation so that the module's maximum operating temperature is not exceeded.

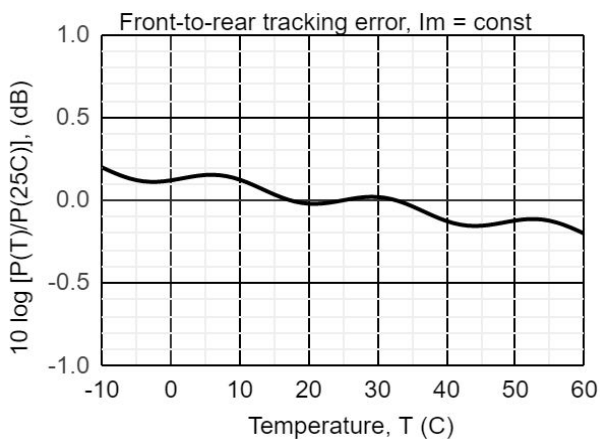
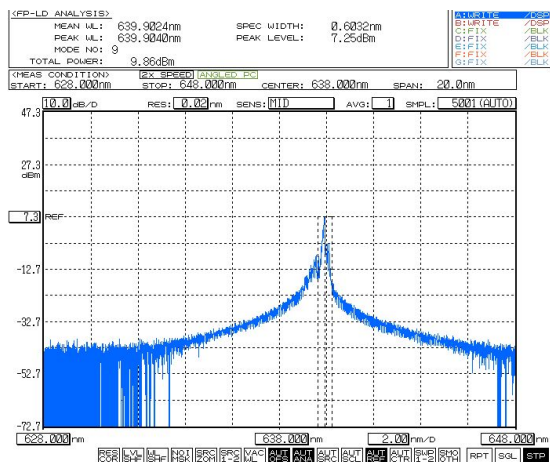
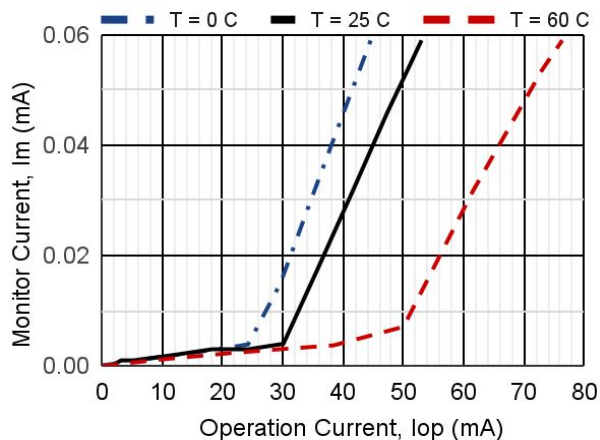
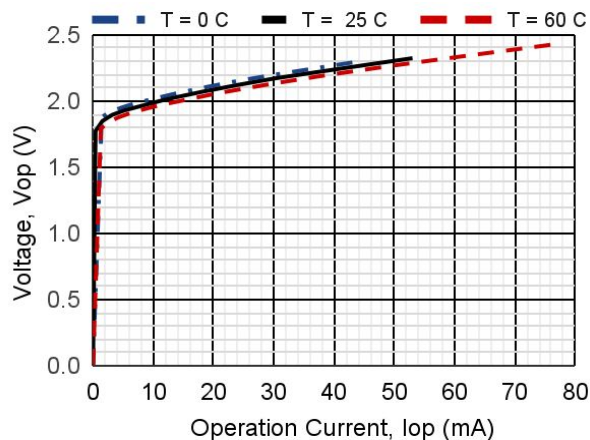
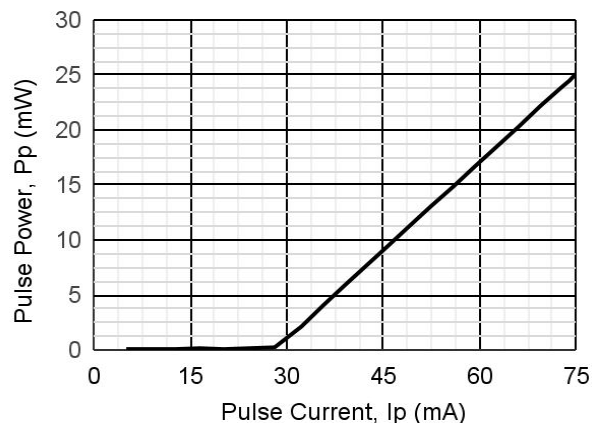
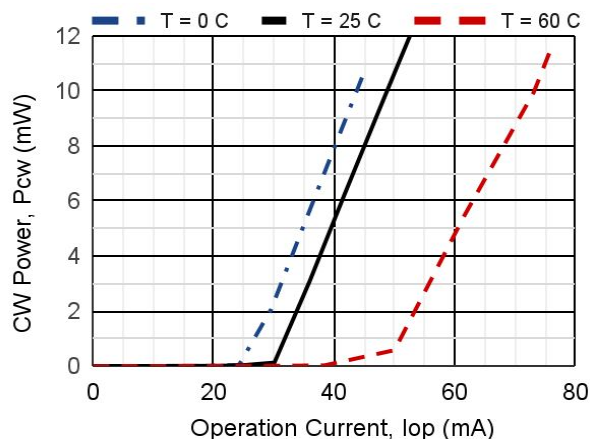
Operating temperature for the DIL, DILRAD and BTF 14-pins case T with TEC is defined for internal temperature stabilization at $T_{st} = 25^{\circ}\text{C}$ that corresponds to thermistor resistance $R_t = 10 \text{ k}\Omega$.

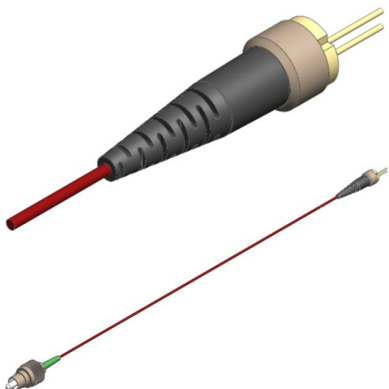
LD4B-638-FP-10**ELECTRICAL-OPTICAL CHARACTERISTICS (T = 25 °C)**

Parameter		MIN	TYP	MAX	Unit	Conditions
Optical power (CW)	P _{cw}	10	13		mW	CW, I _{op} = 53 mA, SM04
Optical power (pulse)	P _p	20	25		mW	Pulse, I _p = 70 mA, duration 5 us, duty cycle 1%
Mean wavelength	λ	635	638	642	nm	CW, I _{op} = 53 mA
Spectral width	Δλ		1	3	nm	CW, I _{op} = 53 mA
Wavelength-temperature coefficient	dλ/dT		0.17		nm/°C	CW, I _{op} = 53 mA
Threshold current	I _{th}		35	45	mA	
Slope efficiency	S _e	0.40	0.55		mW/mA	CW, SM04
Operating voltage	V _{op}		2.3	2.5	V	CW, I _{op} = 53 mA
Monitor current	I _m	0.03	0.06	0.3	mA	CW, I _{op} = 53 mA, V _r = 5 V
Polarization extinction ratio	PER	17				CW, I _{op} = 53 mA, SMP04
Tracking error	ER		0.3	0.6	dB	CW, I _{op} (25C)=35 mA, I _m = const T = -10 ~ +50 C

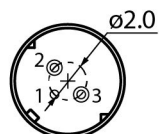
Tracking error ER = max |10 lg [P(T)/P(25C)]|, I_m = const, T = T_{min} ÷ T_{max}

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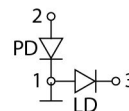
LD4B-638-FP-10**COAX**

BACK VIEW



PINOUT

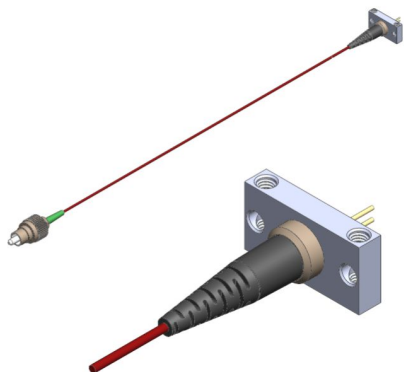
#3

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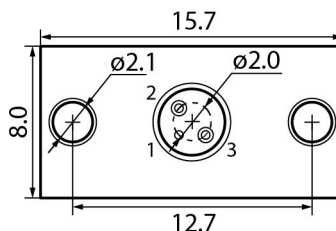
Drawing

3D model

Application Notes

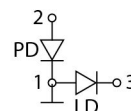
**COAXB**

BACK VIEW



PINOUT

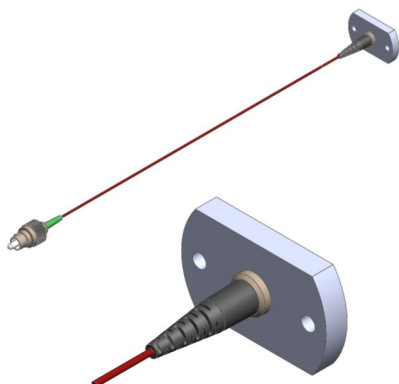
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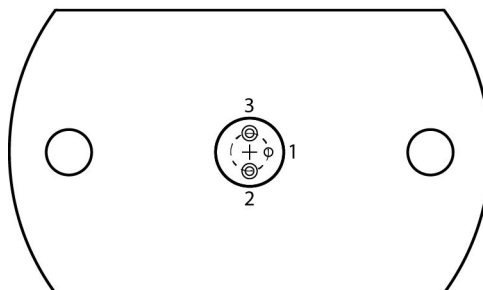
Drawing

3D model

Application Notes

**PACKAGE TH**

BACK VIEW



PINOUT

#3

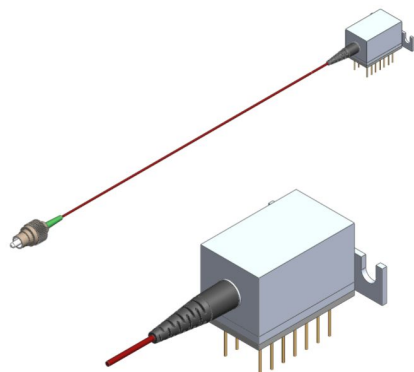
Thorlabs Pin Code A

Compatible to Thorlabs
LDM9LP mountDownload more
information

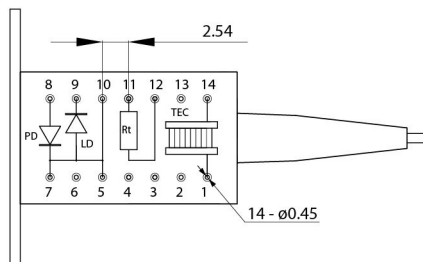
Drawing

3D model

Application Notes

LD4B-638-FP-10**DIL**

BOTTOM VIEW



PINOUT #2, #3

- 1.TEC Anode
- 2.-
- 3.-
- 4.-
- 5.LD Anode
- 6.-
- 7.PD Cathode, LD Anode
- 8.PD Anode
- 9.LD Cathode
- 10.LD Anode
- 11.Thermistor
- 12.Thermistor
- 13.-
- 14.TEC Cathode

TEC HP: $I_{\max} = 1.4A$, $U_{\max} = 3.9V$, $Q_{\max} = 3.3W$,
 $AC R = 2.0 \Omega$, $\Delta T_{\max} = 69 K$

Thermistor:
 $R_t = 10 * \exp(3600 * \{1/T[K] - 1/298\}) \text{ k}\Omega$

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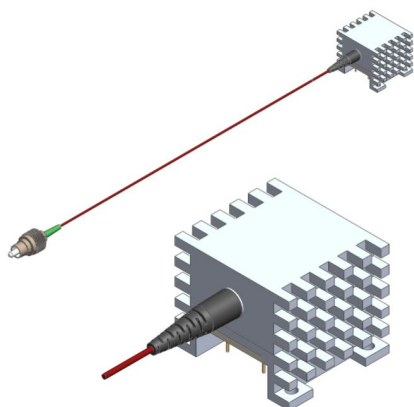
Drawing



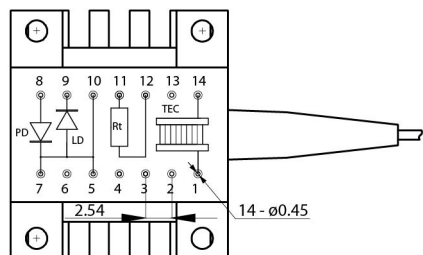
3D model



Application Notes

**DILRAD**

BOTTOM VIEW



PINOUT #2, #3

- 1.TEC Anode
- 2.-
- 3.-
- 4.-
- 5.LD Anode
- 6.-
- 7.PD Cathode, LD Anode
- 8.PD Anode
- 9.LD Cathode
- 10.LD Anode
- 11.Thermistor
- 12.Thermistor
- 13.-
- 14.TEC Cathode

TEC HP: $I_{\max} = 1.4A$, $U_{\max} = 3.9V$, $Q_{\max} = 3.3W$,
 $AC R = 2.0 \Omega$, $\Delta T_{\max} = 69 K$

Thermistor:
 $R_t = 10 * \exp(3600 * \{1/T[K] - 1/298\}) \text{ k}\Omega$

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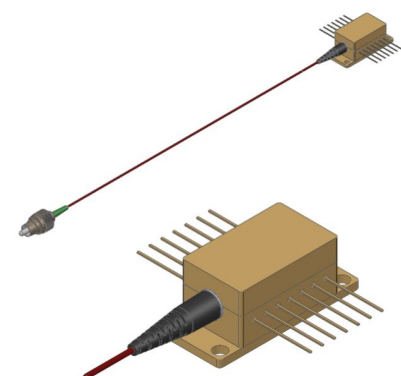
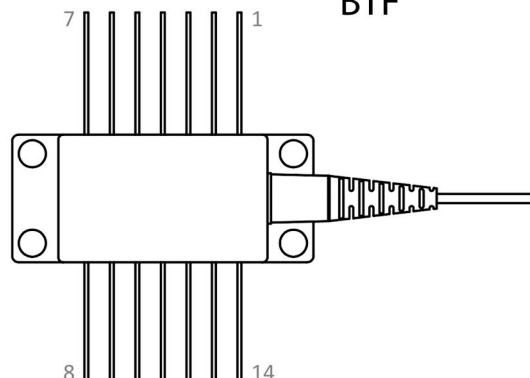
Drawing



3D model



Application Notes

**BTF**

1. TEC+
2. Thermistor
3. NC
4. NC
5. Thermistor
6. NC
7. NC
8. NC
9. NC
- 10 LD/SLD Anode
11. LD/SLD Cathode
12. NC
13. Case Ground
14. TEC -

TEC HP: $I_{\max} = 1.4A$, $U_{\max} = 3.9V$, $Q_{\max} = 3.3W$,
 $AC R = 2.0 \Omega$, $\Delta T_{\max} = 69 K$

Thermistor:
 $R_t = 10 * \exp(3600 * \{1/T[K] - 1/298\}) \text{ k}\Omega$

Download more
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Drawing



3D model



Application Notes

LD4B-638-FP-10

Characteristics, data, materials and structures specified in this datasheet are subject to change without notice. Please refer to the latest specification before use of the products.

Safety and handling cautions

1. Avoid smashing and burning of the module. Avoid storing and using the module in conditions where water, organic solvents or aggressive acids or bases may contact the module or where there is a possibility of exposure to corrosive gases, explosive gases, dust, salinity or other harsh conditions. The module should be disposed as special industrial waste.
2. Exceeding absolute maximum ratings even for a short time can cause permanent damage of the module.
3. The module is sensitive to and can be broken by ESD (static electricity).

Conflict Minerals Policy Statement

LD4B achieves business objectives and customer needs with social responsibility. We do not support or contribute to the violence and human rights violations associated with the mining of conflict minerals coming from Conflict Regions according to US "Dodd-Frank Act". When possible, our suppliers' conflict mineral statements are reviewed. We do not directly purchase Conflict Minerals from any source and do not knowingly procure any parts and products containing Conflict Minerals from Conflict Regions.

RoHS Compliance Statement

Restriction of Hazardous Substances (RoHS) directive (Directive 2011/65/EC amended with Directive (EU) 2015/863) is the directive aimed at reducing the harmful environmental impact of waste electrical equipment by restricting the use of known dangerous substances. Based on information received from our supply sources, LD4B hereby states that the banned substances listed in the RoHS directive are not found in the parts and materials used above the threshold level listed other than exceptions approved by the European Commission.

REACH Compliance Statement

Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) is a European Union regulation 1907/2006/EC that addresses the production and use of chemical substances, and their potential impacts on human health and the environment. Based on information received from our supply sources, LD4B hereby states compliance of the parts and materials used in manufacturing to REACH regulation. LD4B does not manufacture or import any substances or preparations as defined under REACH.