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SPECIFICATIONS

Direct Modulation Ultra Narrow Linewidth Laser Box

DL-BF10-CLSxxxB-Syyyy-zz

DenseLight Semiconductors reserves the right to make product design or specifications changes without notice.

A. PRODUCT DESCRIPTION

The DenseLight DL-BF10-CLSxxxB-Syyyy-zz is a series of ultra narrow linewidth laser designed for applications in optical metrology & instrumentation and optical gas & chemical sensing, requiring narrow spectral linewidth, excellent SMSR, power stability, and a very highly wavelength stable laser output. The DL-BF10-CLSxxxB-Syyyy-zz is complete with a DenseLight 14-pin BTF package laser, a temperature controller and a built-in current driver capable for CW driving, digital or analog modulation input. It is available over a wide wavelength range across the O, E, S, C and L bands, and can be customized with various options to meet your specific needs.

For responsive prototyping enquiries please email: info@denselight.com

B. FEATURES

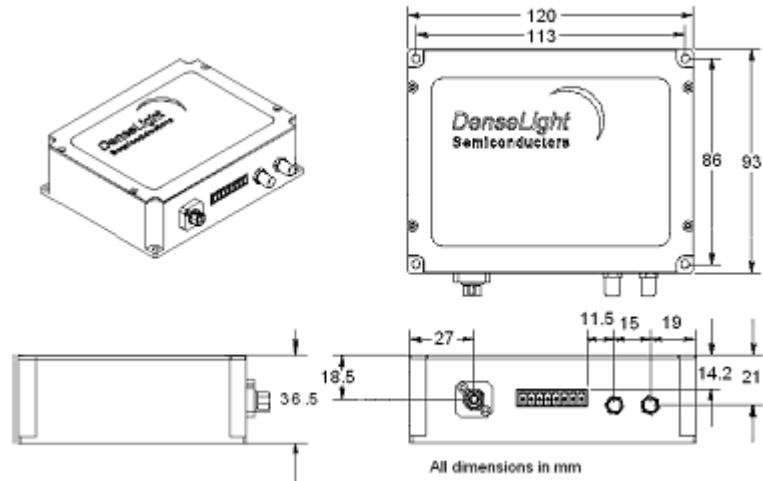
- Wavelength availability 1260 to 1670nm
- Wavelength stability better than +/-1pm
- Typical linewidth of <10kHz to 50kHz
- SMSR >35dB
- Built-in current driver and temperature controller
- Single +5V power supply (optional power adapter)
- RoHS compliance, Telcordia GR-468-CORE
- Integrated optical isolator
- Optical output: FC/APC receptacle
- Dimension: L120 x W93 x H36.5 mm
- Over temperature protection and internal PCB temperature monitor
- Analog intensity modulation up to 20MHz (transconductance amplifier performance)
- Pulse or digital modulation up to 200MHz

C. APPLICATIONS

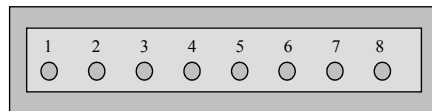
- OTDR
- Optical measuring instrumentation
- Optical gas and chemical sensor

D. PHYSICAL DIMENSIONS AND MECHANICAL SPECIFICATION

Dimension: L120 x W93 x H36.5 mm
 Enclosure: Metal Case
 Optical output: FC receptacle
 Cooling: Air-cooled.
 Electronic interface: 8-pin terminal block



E. PIN ASSIGNMENT AND FUNCTION



8-pin terminal block (Pin 8 near to SMA1)

Pin No.	Symbol	Power/Control /Monitor	Analog /Digital	Input /Output	Description
1	P _{GND}	P			Power Supply Ground
2	V _S	P			+5V d.c.
3	N/C				
4	N/C				
5	N/C				
6	T _{MON}	M	A	O	To monitor the temperature of PCB
7	N/C				
8	A _{GND}				Signal Ground for Control and Monitor Signals

F. ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Condition	Min	Max	Unit
Operating temperature (chassis)	T _{op}	I _{op}	0	50	°C
Operating Relative Humidity	RH	I _{op}		85	%
Storage temperature	T _{stg}	Unbiased	-40	85	°C
Input current	I _s			6	A
Input Power Supply	V _s			6	V

G. ELECTRICAL SPECIFICATIONS ¹

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Input Power Supply	V _s	T _{op} = 0 to 50 °C	4.75	5	5.5	V
Input Current	I _s	T _{op} = 0 to 50 °C			2.5	A
Total Power consumption	P _s	T _{op} = 0 to 50 °C			12.5	W
Internal PCB Temperature Monitor	T _{MON1}	Analog voltage: T _{MON} = 395mV + (6.2mV/°C x T), T = PCB temperature in °C				mV
Voltage	V _{OUT}	R _x = infinite	0		2.5	V
Output Impedance	R _{OUT}			150		Ω
Source Current	I _{OUT}	V _{OUT} = 2.5V			4	mA

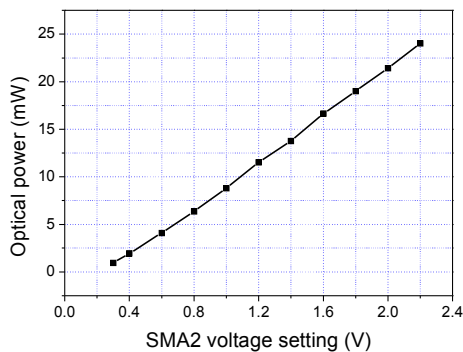
¹⁾ Unless otherwise specified, tests are performed at T_{op} = 25°C

²⁾ Depending on product selection

Operating mode ³	Operation Setting	
	SMA1 connector (50Ω)	SMA2 connector (50Ω)
CW	Logic High, $2V \leq V_{IH} \leq 5V$	DC Voltage (User to set optical peak power through DC voltage to SMA2)
Digital modulation ⁴	External Trigger Input (CMOS/TTL compatible), $0 \leq V_{IL} \leq 0.8V$ and $2V \leq V_{IH} \leq 5V$	DC Voltage (User to set optical peak power through DC voltage to SMA2)
Analog modulation ⁴	Logic High, $2V \leq V_{IH} \leq 5V$	Transconductance amplifier operating on positive polarity analog input signal

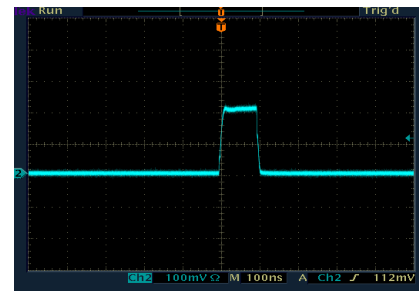
³⁾ There will be no optical output power if SMA1 or SMA2 is left unconnected.

⁴⁾ Pre-bias setting on laser can be factory preset. Please specify the amount of pre-set bias (in terms of X% of optical power). Note: Factory default setting is zero.



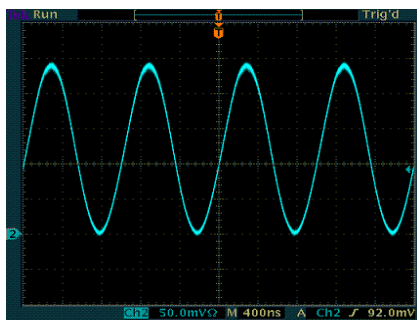
Optical power vs SMA2 voltage setting

Digital modulation:



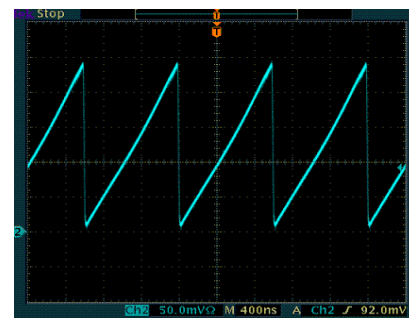
SMA1: Pulse waveform
 Frequency= 100kHz
 Amplitude= 2V
 SMA2: DC voltage 1.8V

Analog modulation



SMA1: Logic high ($V_{IH} = 2V$)
 SMA2: Sine wave
 Frequency: 1MHz
 Amplitude= 0.5 to 2.5V

Analog modulation



SMA1: Logic high ($V_{IH} = 2V$)
 SMA2: Ramp wave
 Frequency: 1MHz
 Amplitude= 0.5 to 2.5V

H. OPTICAL SPECIFICATIONS

Parameter	Symbol	Min	Typ	Max	Unit
Output stability ⁽⁵⁾ 1 hour	Stb			± 0.03	dB
8 hour				± 0.1	dB

⁵⁾ After one hour of warm-up for CW operation

14-Pin Butterfly package CLSxxxB-Syyyy	Min Power (mW)	Peak wavelength (nm)	Side Mode Suppression Ratio (dB)	Linewidth (kHz)
CLS051B-S1260	5	1260±2	>35dB	<50
CLS051B-S1383	5	1383±2	>35dB	<50
CLS101B-S1550	10	1550±2	>35dB	<50
CLS051B-S1648	5	1648±2	>35dB	<50
CLS051B-S1665	5	1665±2	>35dB	<50

The full optical performance of the DL-BZ1-CLSxxxB-Syyyy-zz can be found in DenseLight standard 14-pin Butterfly package CLSxxxB-Syyyy series individual specification. Please contact DenseLight Semiconductor Pte Ltd for further information.

I. ORDERING INFORMATION

Please use the following part code system to order products.

DL-BZ1-CLSxxxB-Syyyy-zz

Part code:

- 1) CLSxxxB-Syyyy refers to DenseLight standard 14-pin Butterfly package. Refer to the summary in section H for the code number.
- 2) zz denotes the factory laser optical power pre-bias setting:
 - 00= Zero bias (factory default)
 - zz= Pre-bias 01 to zz% (eg. 05 denotes 5% optical power pre-bias)

J. REVISION CONTROL

Authorized Personnel	Rev	Description of Change	Date
OTK	A	Initial: Prelim Production Release	22 April 2009