

All specifications described herein are subject to change without prior notice.

DESCRIPTION

General

The HL13BFCP00-Ln is a 1271/1291/1311/1331 nm CWDM Distributed Feed-Back (DFB) laser diode chip for 25 Gb/s operation. It is designed for use in the dry N2 hermetic sealed package.

PN information

PN	Lane: n	Wavelength* (nm)	Note
HL13BFCP00-L0-x	0	1271	"-x" portion -F: Functional sample Example: HL13BFCP00-L1-F May be packed in GELPAK Null: MP product Example: HL13BFCP00-L1
HL13BFCP00-L1-x	1	1291	
HL13BFCP00-L2-x	2	1311	
HL13BFCP00-L3-x	3	1331	

* Actual wavelength range is specified separately.

Block Diagram



Fig 1. Block Diagram

Table 1. Pin Configurations

Pin #	Description	Remarks
1	Laser anode (P electrode)	
2	Laser cathode (N electrode)	

PERFORMANCE SPECIFICATIONS

Absolute Maximum Ratings

Since the HL13BFCP00-Ln is a chip form, the performance will depend on not only chip performance but also its assembling process. If the chip is assembled in a proper way, the performance described in Table 2 can be expected but these are not guaranteed values.

Tc means submount temperature when the chip mounted on Oclaro standard submount soldered on heat sink.

Table 2. Absolute Maximum Ratings (Tc=25°C, unless otherwise specified)

	Absolute Maximum Rating	Min	Max	Unit	
1	Storage temperature	-40	100	°C	
2	Operating temperature	0	75	°C	Note1
3	Laser forward current	-	120	mA	
4	Laser reverse voltage	-	2	V	
5	Die bonding temperature	-	350	°C	(<4s) Note2

Note 1: It does not guarantee the operating characteristics.

Note 2: Recommended condition: 320 C max and 4 s max.

Optical and Electrical Characteristics

Since the HL13BFCP00-Ln is a chip form, the performance will depend on not only chip performance but also its assembling process. If the chip is assembled in a proper way, the performance described in Table 3 can be expected but these are not guaranteed values.

Tc means submount temperature when the chip mounted on Oclaro standard submount soldered on heat sink.

Table 3. Expected Optical and Electrical Characteristics
(Tc= 20 to 65 C, unless otherwise specified. Condition at CoC: Chip on testing carrier)

Items	Symbol	Min.	typ.	Max.	Units	Notes	
Threshold	I _{th}	-	15	18	mA	Tc=65C	
Operating Current	I _f	-	-	60	mA	CW, P=5.5mW	
Slope Efficiency	SE	0.11	-	-	W/A	CW, I=60mA	
Laser Forward Voltage	V _f	-	-	2	V	CW, I=85mA	
Resistance	R _s	-	9	12	Ω		
Wavelength	L0	λ ₀	1264.5	1271	1277.5	nm	CW, P=5.5mW
	L1	λ ₁	1284.5	1291	1297.5		
	L2	λ ₂	1304.5	1311	1317.5		
	L3	λ ₃	1324.5	1331	1337.5		
Side Mode Suppression Ratio	SMSR	35	-	-	dB	CW, P=5.5mW	
Horizontal FFP	FFP-H	-	-	40	deg	CW, P=5.5mW (parallel)	
Vertical FFP	FFP-V	-	-	45	deg	CW, P=5.5mW (perpendicular)	
Relative Intensity Noise	RIN	-	-	-130	dB/Hz	CW, P=5.5mW	
Small Signal Modulation Bandwidth	BW	21	-	-	GHz	CW, I=60mA 3dBdown	

Chip Test Specification

Oclaro (supplier) will perform 100% probe testing on the chips described in Table 4 below. Only chips that pass the criteria in Table 4 will be shipped. The test will be done in bar or chip form using pulsed driving current.

Although chips pass the criteria described in Table 4, Oclaro assumes no responsibility for those performance, yield and reliability when they are assembled and/or tested in customer (buyer).

Ts means chip stage temperature in pulse chip test.

Table 4 Chip test criteria

No.	Parameter	Symbol	Condition	Min	Max	Unit	Remark
1	Threshold current	I_{th}	$T_s=65^{\circ}C$	—	18	mA	
2	Slope efficiency	Eta	$T_s=65^{\circ}C$, $I_F=60mA$	0.11	—	W/A	Using Oclaro standard tester
3	Kink	Kink	$I_F=I_{th}+5$ to 100mA, $T_s=65^{\circ}C$	-20	+20	%	Fig.2
4	Output Power	P_o	$T_s=65^{\circ}C$, $I_F=60mA$	5.5	—	mW	Using Oclaro standard tester
5	Peak wavelength	λ_0	$T_s=65^{\circ}C$ ($P=5.5mW$)	1269.0	1277.5	nm	
		λ_1		1289.0	1297.5		
		λ_2		1309.0	1317.5		
		λ_3		1329.0	1337.5		
6	Side mode suppression ratio	SMSR	$T_s=65^{\circ}C$ ($P=5.5mW$)	35	—	dB	

Note:

The value is subject to change when the measurement set is renewed.

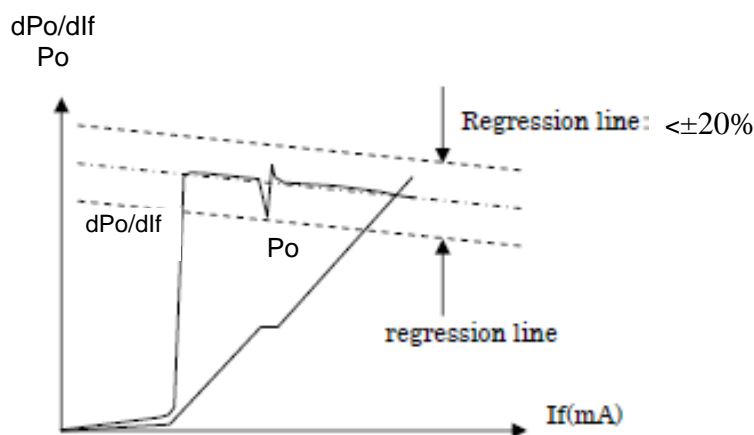


Fig 2 Kink definition

Wafer Verification Test

Oclaro performs wafer screening under proprietary test conditions.

Burn-in

Normally the burn-in process is applied to the TOSA/CAN or equivalent assembling process in order to stabilize the LD with respect to the reliability and the degradation rate. The conditions depend on the TOSA structures or materials, and therefore it is important to choose the appropriate conditions. Oclaro will support to define customer's burn-in conditions.

Device Handling

The LD chip is sensitive and should be handled with care. Both cavity facets and mesa portion should not be touched to avoid any damage.

Recommended Bonding Conditions

Process	Recommended Conditions	
Die Attach (Die Bonding)	Solder	AuSn
	Temperature	320 deg C
	Dwell time	4 s max.
	Pressure	14 gf
	Atmosphere	N2 flow
Wire Bonding	Au Wire	
	Ball bond	
	Diameter of Wire	25 μ m
	Weight	30 g
	Temperature	130 to 140 deg C

The conditions may be adjusted depending on the bonding equipment.

MECHANICAL DIMENSIONS

The chip size is 360 μm x 150 μm x 87 μm. Fig. 3 shows the chip outline and metallization patterns.

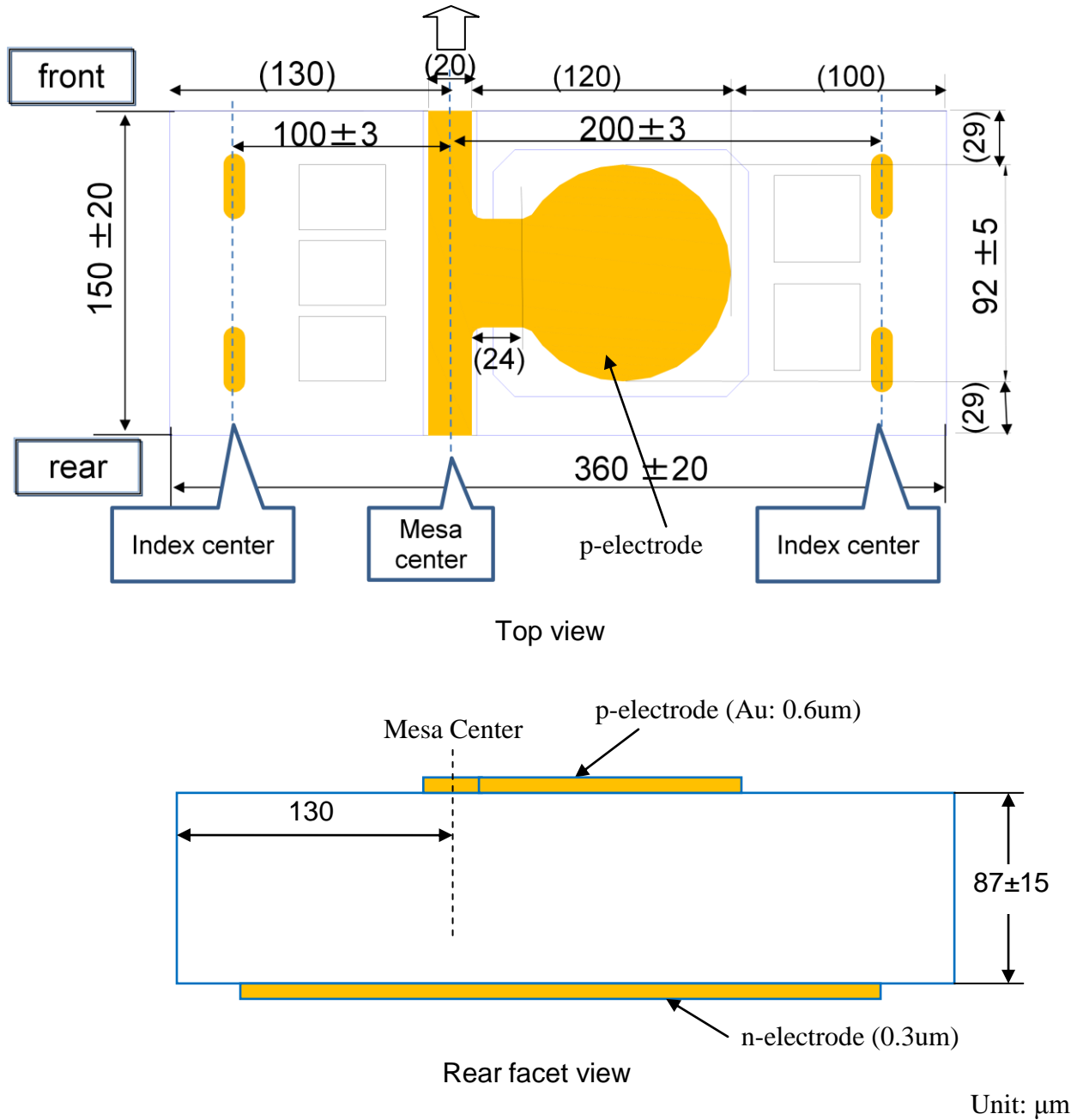


Fig 3 Chip Outline and Dimensions

Note:

The 1st wire bonding at p-electrode PAD is recommended.
Value without tolerance is typical one.

OTHER SPECIFICATIONS

Packing and label

The products will be packed on Blue Tape in Grip Ring as described in Fig. 4 below.

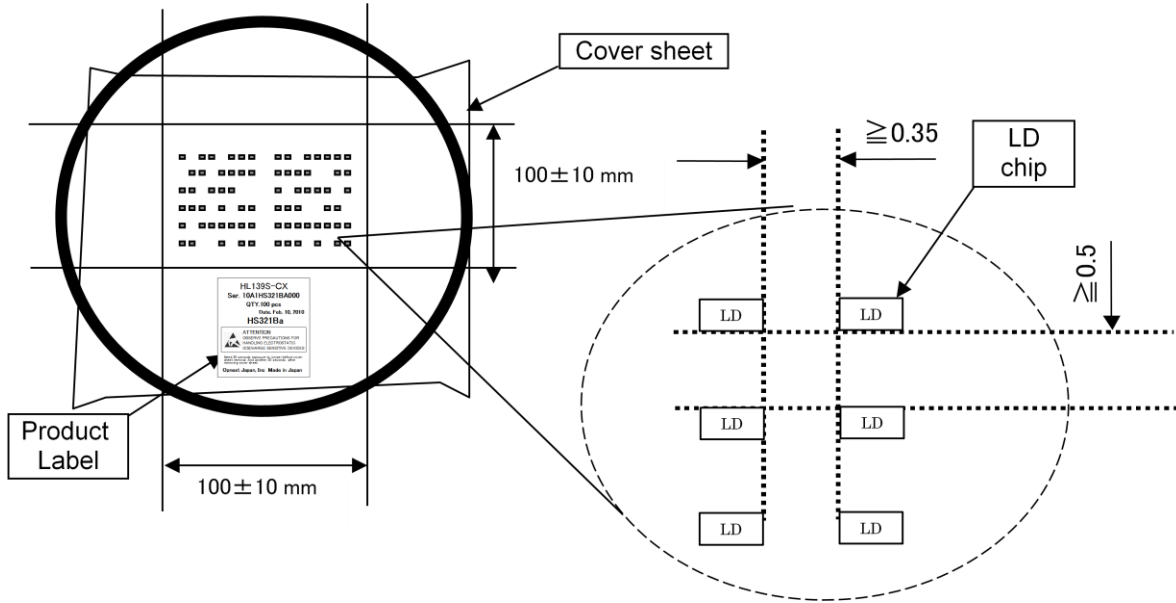


Fig 4 Packing format

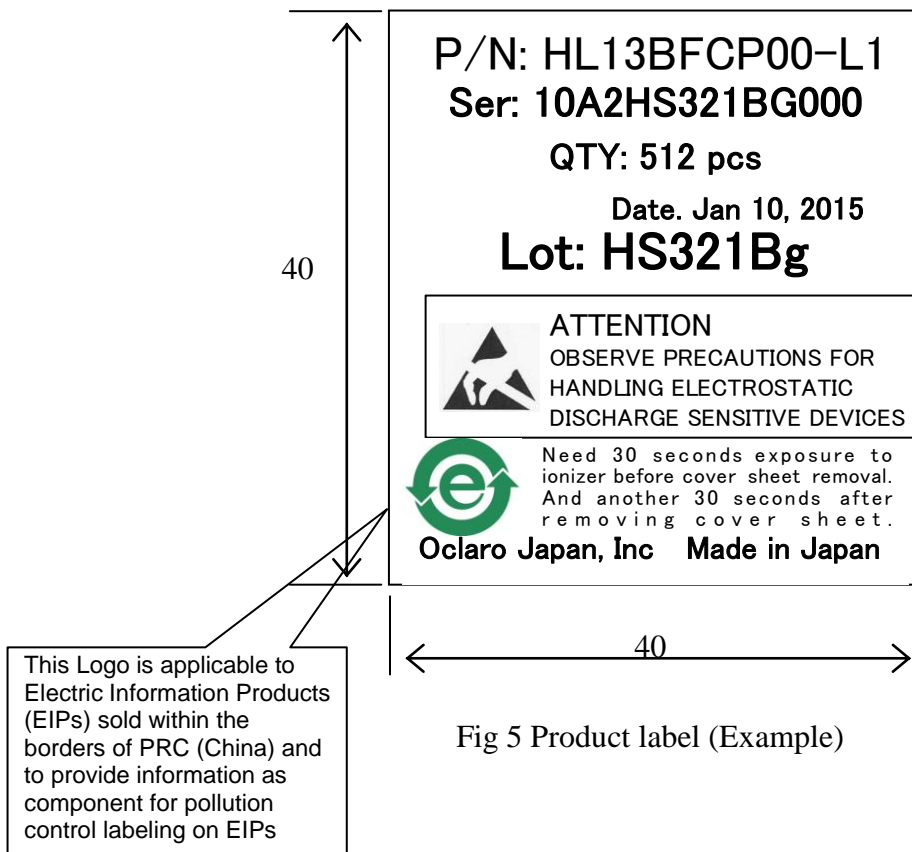
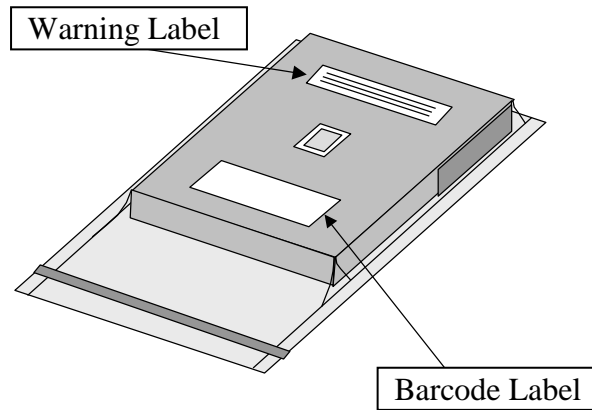


Fig 5 Product label (Example)



The plastic bag is vacuum-packed.

Fig 6 Packing bag (Example)

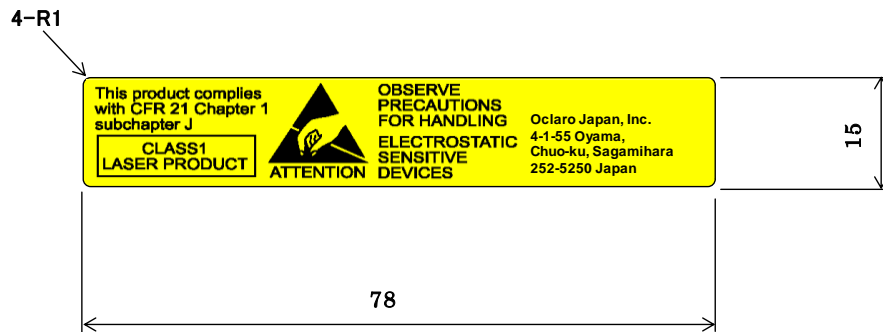


Fig 7 Warning Label (Example) 単位 : mm

Bar code label is on plastic bag for each shipment form. Supplier Product Name, Supplier lot number and Quantity. Please see Fig.8. 40x 80 mm

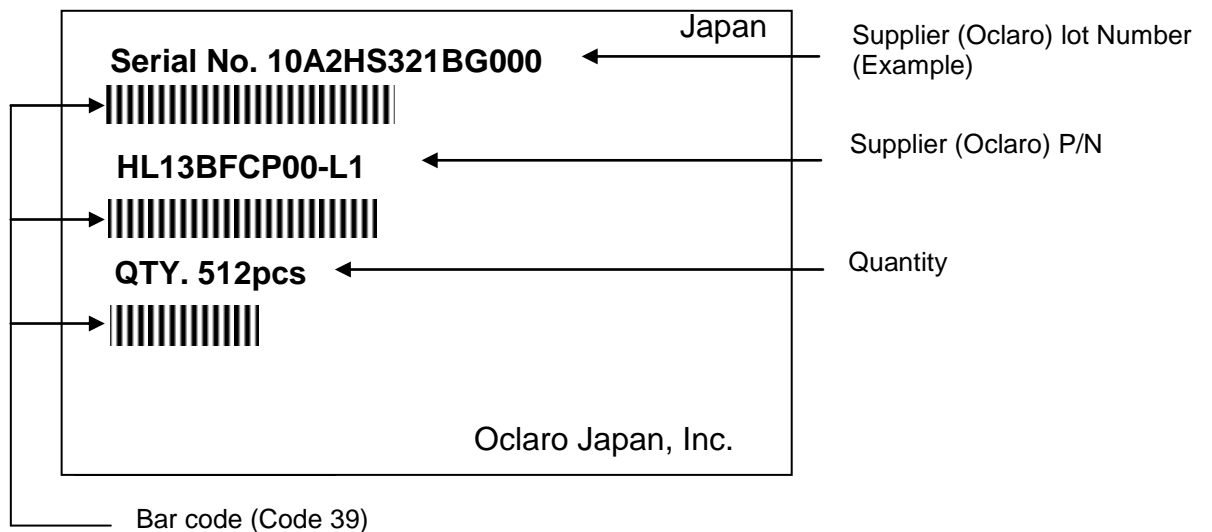


Fig. 8 Bar code label on outer plastic bag (Example)

Preliminary Data Sheet Disclaimer

The **preliminary data sheet** is provided in order to finalize the product specifications. This data sheet is not applicable to products in MP. Until Oclaro releases these products for general sales, Oclaro reserves the right to change prices, features, functions, specifications, capabilities and release schedule.

Sample Categories and Disclaimer

Functional sample that has the suffix of “-F” or “-Fx” to the product number is a sample that is designed according to the customer’s request. The purpose of this sample is to check and confirm the product feasibility. Thus the sample may be an R&D prototype or may be a modified current product. This sample may not be manufactured in qualified production lines nor using qualified parts. Basically Oclaro guarantees the requested performance of BOL (Beginning Of Life). Any qualification will not be applied.

Working sample that has the suffix of “-W” or “-Wx” to the product number is a sample to evaluate, confirm and finalize the product specifications. Basically Oclaro guarantees the performance of BOL (Beginning Of Life). Not all qualifications may be completed. This sample may not be manufactured in qualified production lines nor be using qualified components. Until Oclaro Inc. releases the products for general sales, Oclaro Inc. reserves the right to change prices, features, functions, specifications, capabilities and release schedule.

Revision History

Rev	Date	Page/Line/Fig/Table	Modification	Note
0.0	SEP 18, 2015			Initial Issue