Preliminary Technical Data

HL13BFCP00-x

DFB Laser Diode Chip

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

DESCRIPTION

General

The HL13BFCP00-x is a 1310 nm Distributed Feed-Back (DFB) laser diode chip for 25 Gb/s operation.

PN information

PN	Wavelength* (nm)	Note
HL13BFCP00-F	1310	Functional samples or small qty order for evaluation use. May be packed in GELPAK
HL13BFCP00	1310	Full spec Mass production use Packed in Grip Ring

* 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)	

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PERFORMANCE SPECIFICATIONS

Absolute Maximum Ratings

Since the HL13BFCP00-x 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	10	70	°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-x 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 at MP
(Tc= 20 to 65 C, unless otherwise specified. Condition at CoC: Chip on testing carrier)

Items	Symbol	Min.	typ.	Max.	Units	Notes
Threshold	Ith	-	10	15	mA	
Operating Current	If	-	-	60	mA	CW, P=5.5mW
Slope Efficiency	SE	0.11	-	-	W/A	CW, I=60mA
Laser Forward Voltage	Vf	-	-	2	V	CW, I=85mA
Resistance	Rs	-	9	12	Ω	
Wavelength	λ	1295	1310	1325	nm	CW, P=5.5mW
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

Note: For the Functional samples, the f3dB will be > 20 GHz.

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 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°C	—	15	mA	
2	Slope efficiency	Eta	T_s=65°C, I_F=60mA	0.11	—	W/A	Using Oclaro standard tester
3	Kink	Kink	I_F=Ith+5 to 60mA, T_c=25°C I_F=Ith+5 to 100mA, Tc=65°C	-20	+20	%	Fig.2
4	Output Power	Po	T_s=65°C, I_F=60mA	5.5	—	mW	Using Oclaro standard tester
5	Peak wavelength	λ_p	Ts=25°C (P=5.5mW)	1300	1320	nm	
6	Side mode suppression ratio	SMSR	Ts=25°C (P=5.5mW)	35	—	dB	
			Ts=65°C (P=5.5mW)	35	—	dB	

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

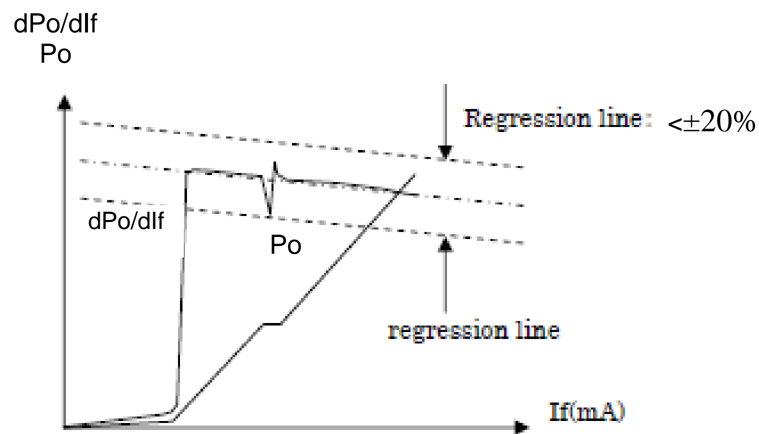


Fig 2 Kink definition

Wafer Verification Test

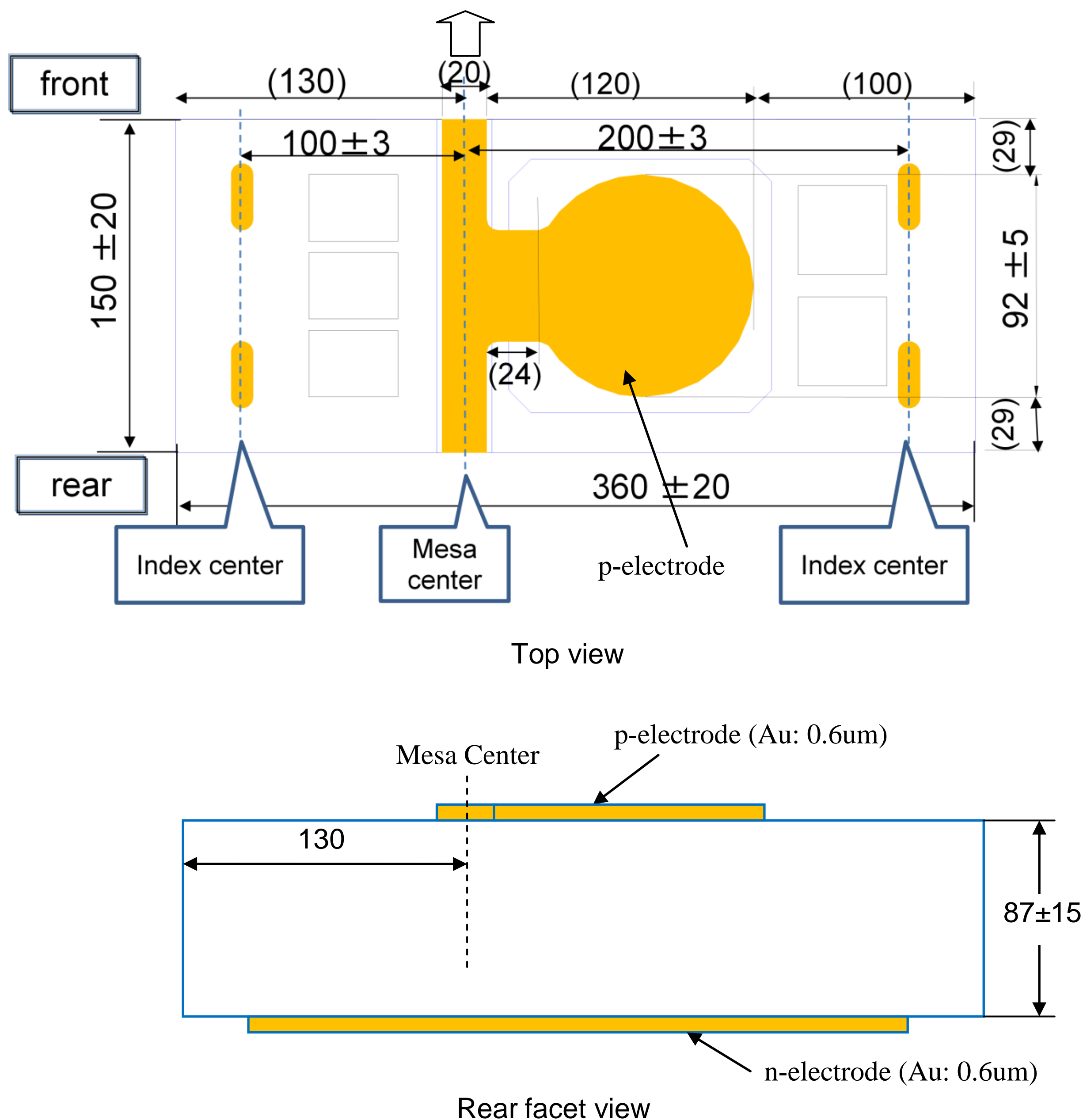
Oclaro performs wafer screening under proprietary test conditions.

Burn-in

- Normally the burn-in process is applied to the TOSA 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.

MECHANICAL DIMENSIONS

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



Unit: μm

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.

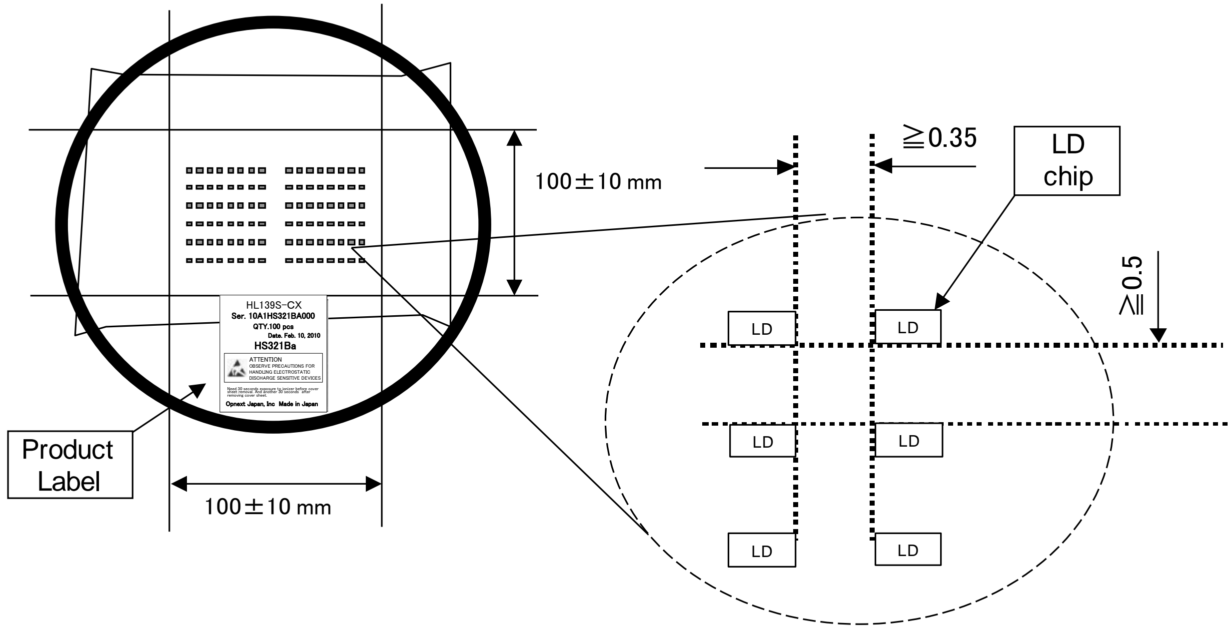


Fig 4 Packing format

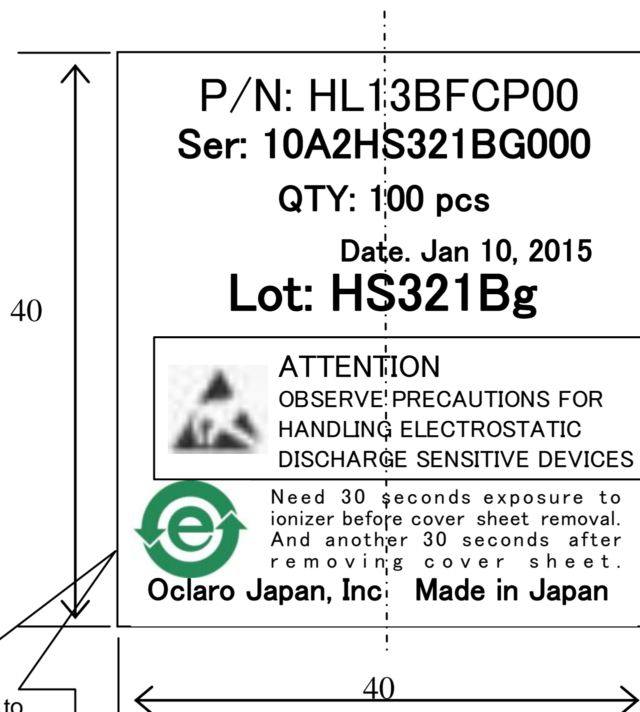
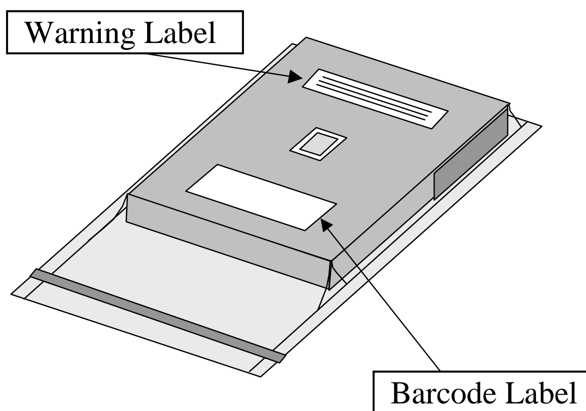


Fig 5 Product label (Example)



The plastic bag is vacuum-packed.

Fig 6 Packing bag (Example)

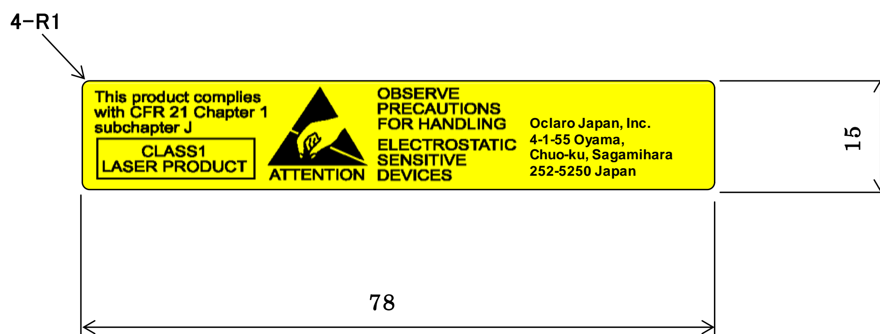


Fig 7 Warning Label (Example) 単位：㎜

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

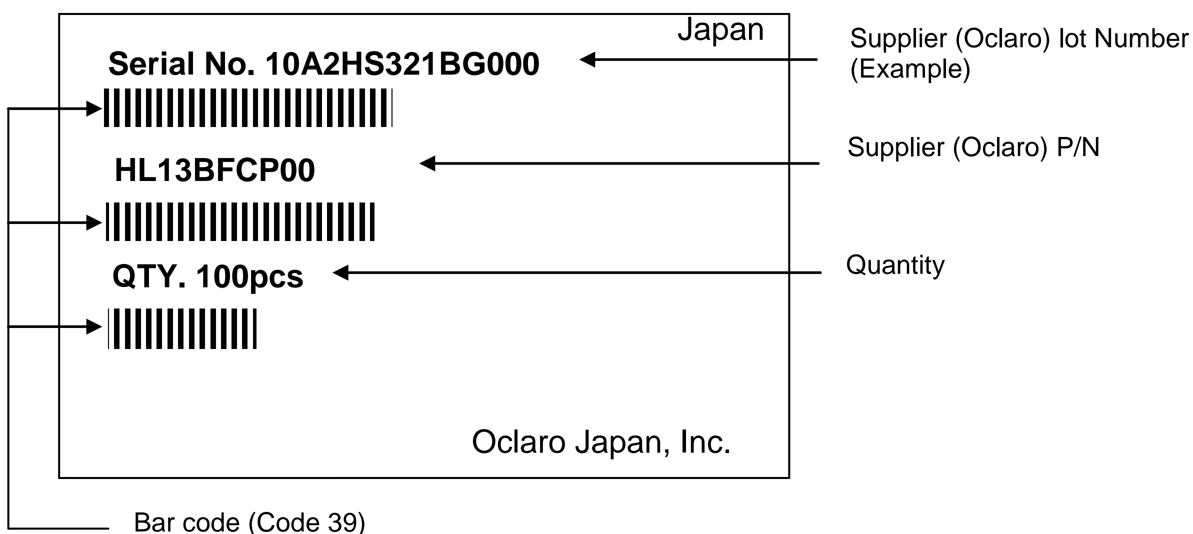


Fig. 8 Bar code label on outer plastic bag (Example)

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 Opnext releases these products for general sales, Opnext 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 Opnext 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 Opnext 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 Opnext Inc. releases the products for general sales, Opnext Inc. reserves the right to change prices, features, functions, specifications, capabilities and release schedule.

Revision History

Rev.	Date	Page/Line/Fig/Table	Modification	Note
p0.0	29 JUL 2015			Preliminary