

# Preliminary HL1362CP00-L0

## DFB Laser Diode Chip

This is a preliminary datasheet for information. It may be modified depending on the development and test results. Please confirm the most updated datasheet for usage.

### DESCRIPTION

#### General

The HL1362CP00-L0 is a high power 1270nm Distributed Feed-Back (DFB) laser diode chip for various 10Gbit/s PON application use. Individual chip is designed for 10Gbit/s operation and for use in the dry N2 hermetic sealed package.

PN	Wavelength** (nm)	Notes
HL1362CP00-L0	1270	For MP use
HL1362CP00-L0-F	1270	For initial samples (May be packed in chip tray)

\*\* Actual wavelength range is specified separately.

### Pin Configurations



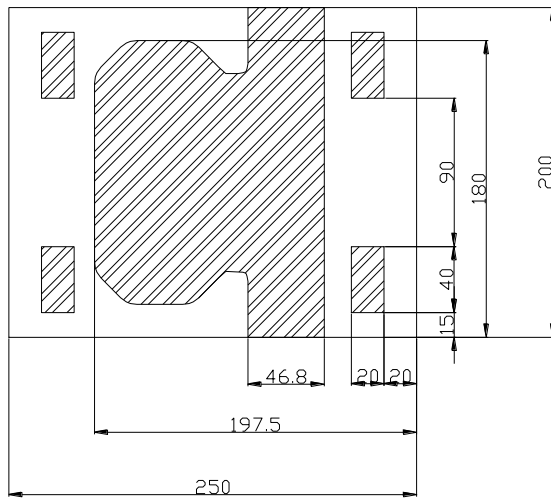
Fig 1. Block Diagram (one LD chip)

Table 1. Pin Configurations

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

## MECHANICAL DIMENSIONS

Individual chip size is  $250\mu\text{m} \times 200\mu\text{m} \times 92\mu\text{m}$ . Fig. 4 shows a chip outline and metallization pattern. The Anode has typ.  $0.55\mu\text{m}$  Au film and Cathode has typ.  $0.57\mu\text{m}$  Au film respectively.



Light output direction

Upper 2 square indexes may be removed in mass production.

Fig.2 Top view (Anode)

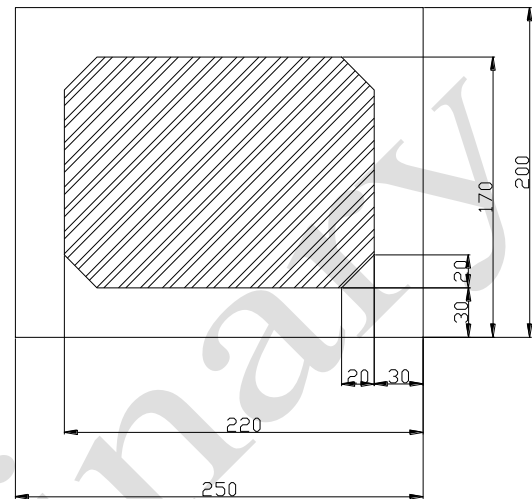


Fig.3 Bottom view (Cathode)

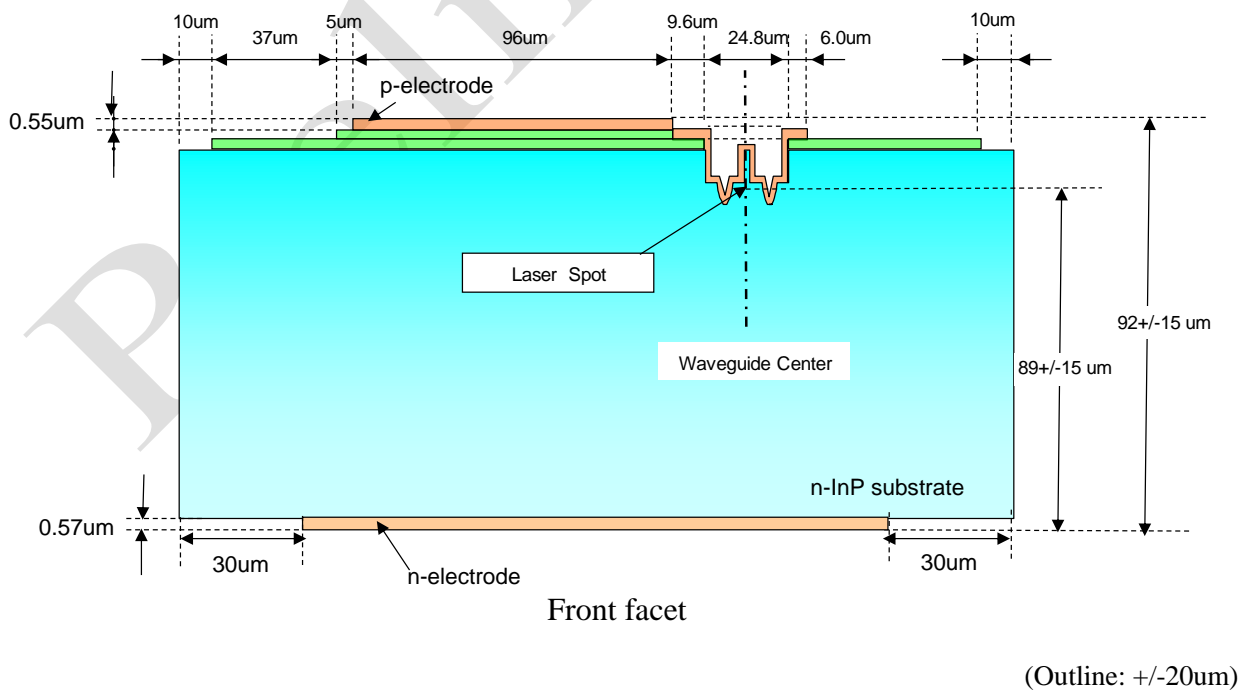


Fig 4 Chip Outline and Dimensions

## PERFORMANCE SPECIFICATIONS

### Absolute Maximum Ratings

Since the HL1362CP00-L0 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. Oclaro assumes no responsibility for those reliability when they are assembled and/or tested in customer Tc means submount temperature when the chip mounted on Oclaro standard sub-mount 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	85	C	
2	Operating temperature	-40	95	C	
3	Laser forward bias current	-	150	mA	
4	Laser reverse bias voltage	-	2	V	
5	Die binding temperature	-	350	C	(< 4s) Note

Note: Recommended condition: 320degC max and 4s max.

### Optical and Electrical Characteristics

Since the HL1362CP00-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.

Table 3. Expected Optical and Electrical Characteristics

(Tc= -5degC to 95degC, unless otherwise specified, Condition at CoC (Chip on testing carrier))

No	Optical and Electrical Characteristics	Min	Typ	Max	Units	Notes
1	Wavelength range	1260 - 1280			nm	-40 to 95degC
2	Wavelength range at 25 C	-	1270	-	nm	@ 25C I=33mA
3	Wavelength temperature coefficient	-	0.1	0.11	nm/degC	
4	Side-mode suppression ratio (SMSR),	35	-	-	dB	@ 1 C I=33mA @ 95 C I=70mA
5	Threshold current	-	8	15	mA	@ 25C
		-	22	30	mA	@ 95C
6	Slope efficiency,	0.3	0.42	-	W/A	@ 25C I=Ith to 33mA
		0.18	0.26	-	W/A	@ 95C I=Ith to 50mA
7	Mask Margin (IEEE 10.3Gb/s)	20	-	-	%	@ 25C I=Ith+25mA PRBS=2 <sup>31</sup> -1, ER=6dB
8	Effective serial resistance	-	9	-	Ohms	@ 95C I=50mA
9	Laser forward voltage	-	1.65	2.0	V	@ 95C I=70mA
10	Kink deviation	-20	-	+20	%	I=Ith+5 to 100mA See figure 5
11	Far field divergence, Vertical ,	-	31	40	degrees	@ 95C I=70mA
12	Far field divergence, Horizontal,	-	30	40	degrees	@ 95C I=70mA

Note: Tc means sub-mount temperature when the chip mounted on Oclaro standard sub-mount soldered on a heat sink.

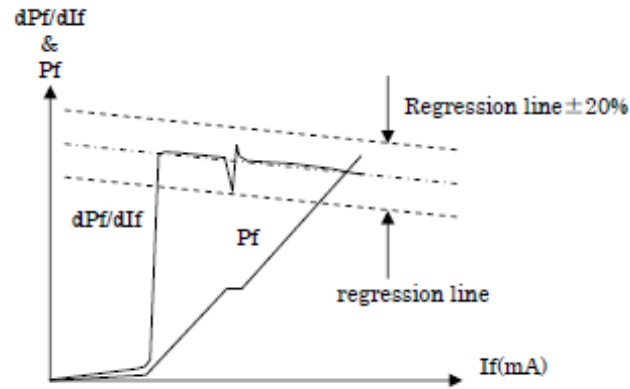


Fig 5 Kink definition

### Chip Test

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

Table 4 Chip test criteria

No.	Parameter	
1	Threshold current	
2	Slope efficiency	
3	Peak wavelength	
4	Side mode suppression ratio	

## Wafer Verification Test

Oclaro will perform hard screening (Burn-In), DC measurement and AC measurement using chips mounted on Oclaro standard submount soldered on heat sink. Only the chips that passed the criteria described in this "Wafer Verification Test" section will be used. Only the chips from wafers meeting the minimum yield described in Table 5 will be shipped.

Table 5 Criteria in wafer verification test

Parameter	Condition	Pass Criterion	Minimum Number or Yield
<b>LD chip mount</b>	-	-	
<b>Start Burn-In test</b>			
Optical Purge test	25°C, 120mA, ACC 3min.	$ \Delta I_{th}  \leq +5\%$ ,	
Electrical Purge test	100°C, 150mA, ACC 20h	$ \Delta I_{th}  \leq +5\%$	
APC Test	95°C, 70mA, APC 100h, ( $I_{op}@100h - I_{op}@0h / I_{op}@0h$ )	$-2\% \leq \Delta I_{op} \leq +0.5\%$ (Note)	
<b>Pass Burn-In test</b>			
<b>Start DC test</b>			
Threshold current	$T_c = 95^\circ\text{C}$	$I_{th} \leq 30\text{mA}$	
Slope efficiency	$T_c = 95^\circ\text{C}$ , $\text{Eta} = P_o(50\text{mA}) / (50\text{mA} - I_{th})$	$\text{Eta} \geq 0.18\text{W/A}$	
Forward voltage	$T_c = 1^\circ\text{C}$ , $I_o = 33\text{mA}$ $T_c = 95^\circ\text{C}$ , $I_o = 70\text{mA}$	$V_{op} \leq 2.0\text{V}$	
Kink deviation,	$T_c = 1^\circ\text{C}$ and $95^\circ\text{C}$ , $I_{th} + 5$ to $100\text{mA}$	$ \text{kink}  \leq +20\%$	
Peak wavelength L0	$T_c = 1^\circ\text{C}$ , $I_o = 33\text{mA}$	$\geq 1264.6\text{nm}$	
	$T_c = 95^\circ\text{C}$ , $I_o = 70\text{mA}$	$\leq 1280.0\text{nm}$	
Side mode suppression ratio	$T_c = 1^\circ\text{C}$ , $I_o = 33\text{mA}$ $T_c = 95^\circ\text{C}$ , $I_o = 70\text{mA}$	$\text{SMSR} \geq 35\text{dB}$	
Beam divergence angle (Horizontal)	$T_c = 95^\circ\text{C}$ , $I_o = 70\text{mA}$	$\text{FWHM}_H \leq 40\text{deg}$	
Beam divergence angle (Vertical)	$T_c = 95^\circ\text{C}$ , $I_o = 70\text{mA}$	$\text{FWHM}_V \leq 40\text{deg}$	
<b>Pass DC test</b>			50%

Note: The criterion  $-2\% \leq \Delta I_{op} \leq +0.5\%$  is for the APC Test.

## OTHER SPECIFICATIONS

### Packing and label

The products will be placed on the Blue-tape film with plastic grip ring and packed as described in Fig. 6 through Fig 10 below.

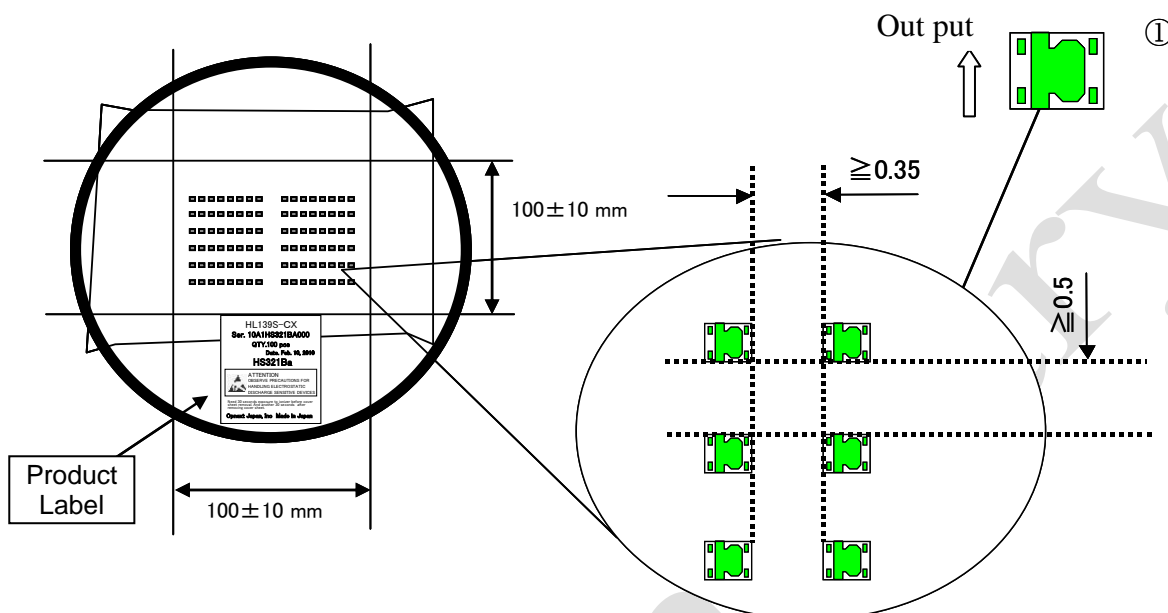


Fig 6 Packing format

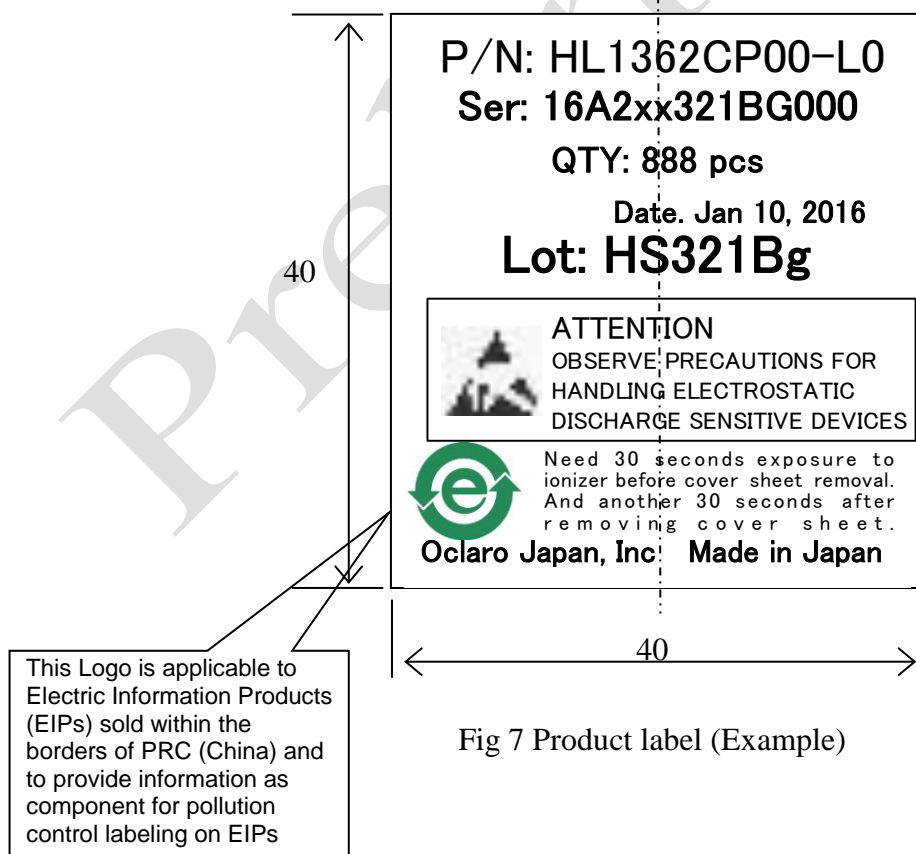
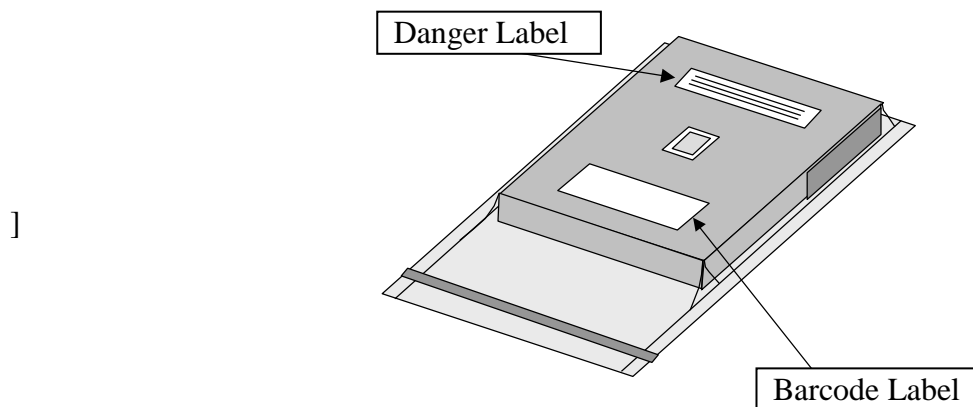


Fig 7 Product label (Example)



The plastic bag is vacuum-packed.

Fig 8 Packing bag (Example)

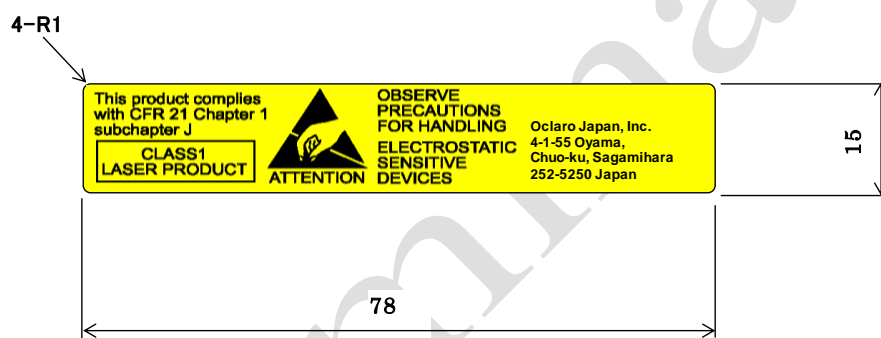


Fig 9 Danger Label (Example)

単位 : mm

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

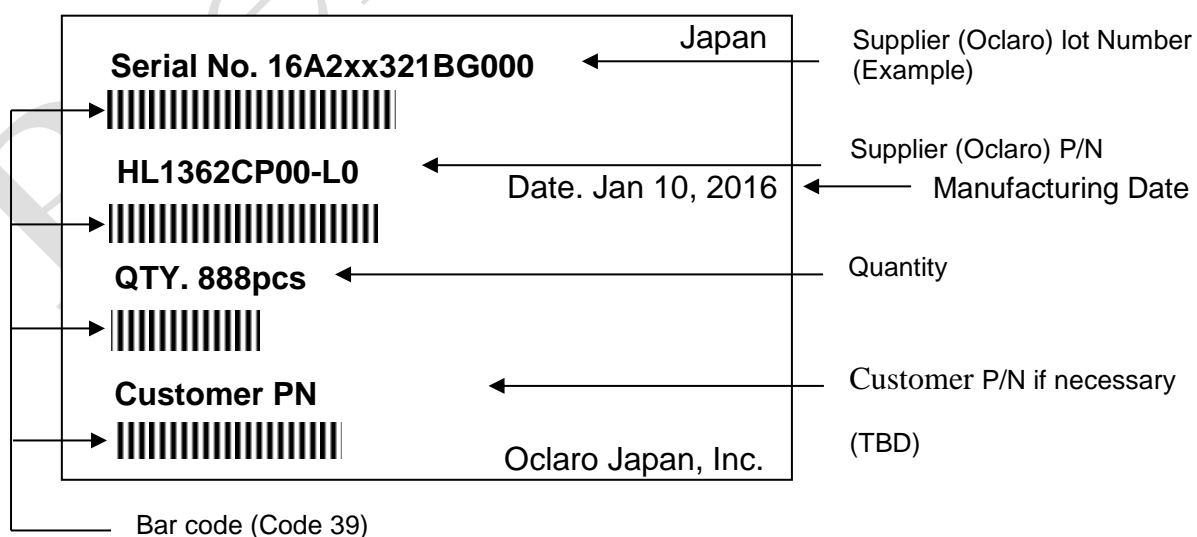


Fig. 10 Bar code label on outer plastic bag (Example)



## Revision History

Rev	Date	Page/Line/Fig/Table	Modification	Note
0.0	Oct.15th, 2016			Preliminary

### **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.