

OEL-53G-C310-H1

53Gbd EML Chip, High Power, For 100G ER1-30km

**OEL-53G-C310-H1 is a lumped electro-absorption modulator laser (EML) diode. It is designed for high-speed digital operation at a controlled temperature range.**

## KEY FEATURES

- ✧ Reliable InGaAsP DFB laser diode butt-joint coupled with electro-absorption (EA) modulator
- ✧ Optimized EA structure for high extinction ratio (ER) operation
- ✧ Superb chip bandwidth > 40GHz enabled by modulator passivation layer design
- ✧ Suitable for 25G/50G NRZ and 53Gbd PAM4 modulation

## APPLICATION

- ✧ 100G LR1-20 and ER1-30
- ✧ 50G ER1-40

## RECOMMENDED OPERATION TEMPERATURE RANGE

Symbol	Parameter	Min.	Max.	Unit
Tc	Test Temperature	43	53	°C

## ELECTRICAL AND OPTICAL CHARACTERISTICS

Expected performance after mounted on chip carrier, not guaranteed. Assembly process may impact the parameter values.

ELECTRICAL AND OPTICAL CHARACTERISTICS (Test temperature=53°C, unless otherwise specified)						
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I <sub>th</sub>	Threshold Current			15	25	mA
V <sub>OP</sub>	Operating Voltage	V <sub>ea</sub> =0V		1.3	1.8	V
P <sub>o</sub>	Optical Output Power, Broad Area PD	I <sub>op</sub> =90mA, V <sub>ea</sub> =0V	11			mW
DC ER	DC Extinction Ratio, Broad Area PD	I <sub>op</sub> =90mA, V <sub>ea</sub> =-2.5V	8			dB
λ <sub>c</sub>	Center Wavelength	I <sub>op</sub> =90mA	1304.5	1311	1317.5	nm
SMSR	Side Mode Suppression Ratio	I <sub>op</sub> =90mA	35			dB
F <sub>v</sub>	Far-field Angle, Vertical			38		deg
F <sub>h</sub>	Far-field Angle, Horizontal			33		deg
f <sub>3dB</sub>	Small Signal Modulation Bandwidth	I <sub>op</sub> =70mA, V <sub>ea</sub> at operation point		40		GHz

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## ABSOLUTE MAXIMUM RATINGS

Values should not be exceeded in any conditions to avoid permanent device damage.

ABSOLUTE MAXIMUM RATINGS				
Symbol	Parameter	Min	Max	Unit
V <sub>RL</sub>	LD Reverse Voltage		2	V
I <sub>f</sub>	LD Forward Current		120	mA
P <sub>o</sub>	Optical Output Power		40	mW
V <sub>RM</sub>	EA Modulator Reverse Bias	-4	0.5	V
T <sub>stg</sub>	Storage Temperature	-40	85	°C

## RECOMMENDED BONDING CONDITIONS

Process	Recommended Condition	
Die Attach* (Die Bonding)	Solder	AuSn 70:30,3um
	Temperature	330 °C
	Dwell time	4.5 sec
	Weight	2.5g
	Atmosphere	N2 flow
Wire Bonding*	Wire	Au 25um Wire
	Bond type	Ball bond
	Weight	20-25g

\*The conditions might be adjusted depending on the bonding equipment.

## BURN-IN CONDITIONS

Optoway will provide recommended burn-in condition. Optoway will further help customers define new burn-in conditions depending on different TOSA structures or materials.

## WAFER QUALIFICATION

Optoway performs the wafer qualification test which includes die bonding / wire bonding test, burn-in test, and O/E characteristics test. Only the chips from qualified wafers will be shipped. All tests are carried out on chip carrier and TO CAN.

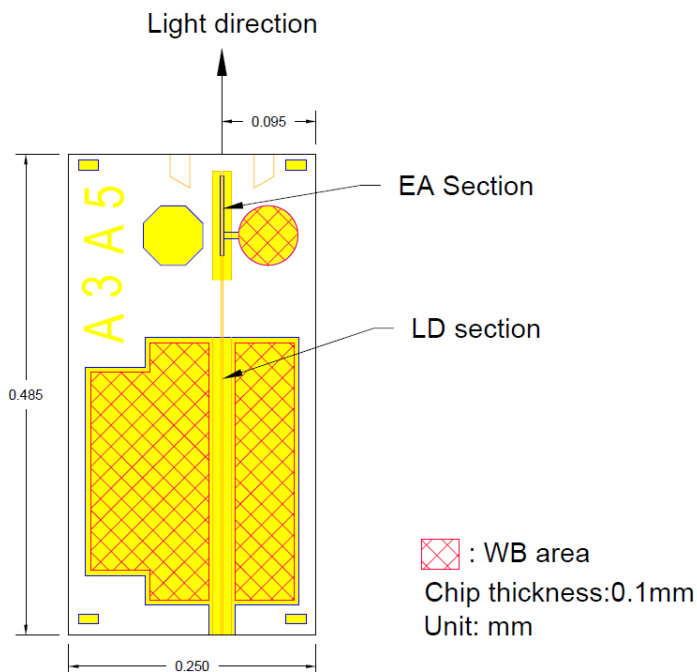
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## CHIP TEST FOR SHIPMENT

ELECTRICAL AND OPTICAL CHARACTERISTICS (Test temperature=53°C, unless otherwise specified)						
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{th}$	Threshold Current			15	25	mA
$P_o$	Optical Output Power, Broad Area PD	$I_{op}=90mA, V_{ea}=0V$	11			mW
DC ER	DC Extinction Ratio, Broad Area PD	$I_{op}=90mA, V_{ea}=-2.5V$	8			dB
$\lambda_c$	Center Wavelength	$I_{op}=90mA$	1304.5	1311	1317.5	nm
SMSR	Side Mode Suppression Ratio	$I_{op}=90mA$	35			dB

## MECHANICAL DIMENSIONS (mm)

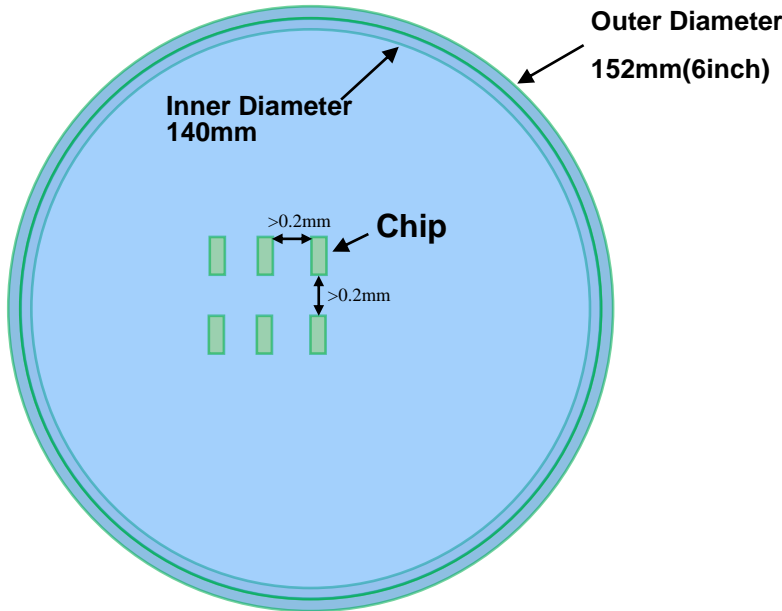


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## PACKAGE INFORMATION

- ✧ Chips will be put on the blue tape, as below figure shown.
- ✧ Distance between chips >0.2mm



## DEVICE HANDLING

- ✧ The chip is sensitive and should be handled with care. Both waveguide section and cavity facets should not be touched to avoid any damage.
- ✧ Electrostatic discharge may cause direct or latent damage to laser diodes. During laser chip assembly, precautions for handling electrostatically sensitive devices must be observed.

## REVISION HISTORY

Version	Subject	Release Date
1.0	Initial release	2023/4/19
2.0	Add transmission distance in chip decription	2024/1/30

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