Data Sheet

CW 1310nm Edge-Emitting DFB Laser Diode Chip

P/N: WCH-C31E-T20

Features

- 1310nm Central Wavelength Range
- Output Power up to 200mW
- TE Polarization
- RoHS Compliant
- Compliant with Telcordia GR-468

Applications

- Laser Source for Silicon Photonics

The products WCH-C31E-T20 are 1310nm 200mW CW edge-emitting DFB laser chips used for 55 °C. The design is based on n-type substrate with multi-quantum well (MQW) active layers and distributed-feedback gratings. The ID codes is printed on the top surface of each chip for identification purpose. All the laser chips come from the certified wafers which must achieve an acceptable yield for burn-in, aging tests.

Absolute Maximum Ratings

Parameter	Min.	Typ.	Max.	Unit	Conditions
Operating Temperature	0	25	75	°C	C-Temp
Storage Temperature	-40	-	100	°C	-
Storage Humidity	-	-	85	%	-
Optical Output Power	-	-	280	mW	CW
Forward Current	-	-	700	mA	
Reverse Voltage	-	-	2	V	

NOTICE：To apply excess of the absolute maximum ratings could cause the permanent damages to the device, and it would adversely affect the device reliability, the table shows the reference parameters but not guarantee the operating characteristics.

Device Handling

- InP chips are inherently fragile and easily damaged. Special caution should be used when handling. Do not handle with tweezers. A vacuum tip with a flat surface is recommended. Facets should not be touched.
- Suggest bonding condition:
- Eutectic AuSn solder (melting point 280°C)
- Bonding temperature: suggest temperature at the header is 315°C ± 5°C @4s
- Bonding force: 25 grams (not exceed 30 grams)
- Wire Bonding temperature: 130 ~ 180°C
- Wire Bonding force: 20 ~ 40 grams (not to exceed 50 grams)
- Part can be cooled once solder fully melted. Keep bonding force applied until the solder solidify (<280°C)

Electrical and Optical Characteristics *(Tc=25°C, unless noted)*

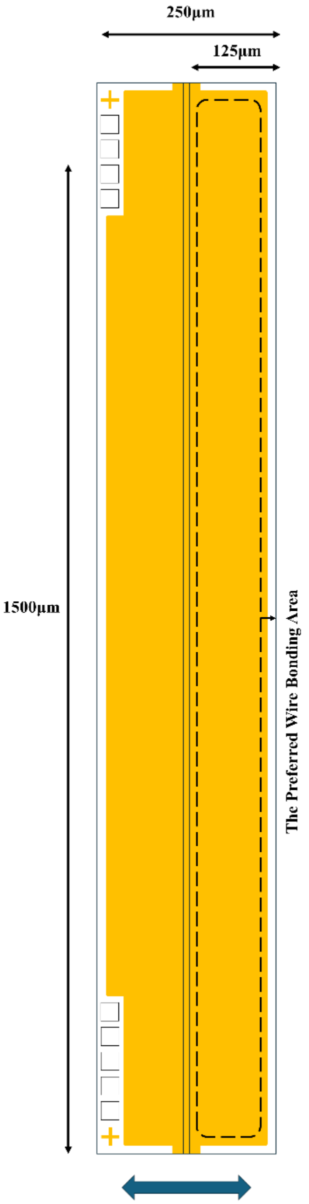
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Threshold Current	I_{th}	CW, $T_c = 25°C$ CW, $T_c = 55°C$	---	35 55	45 65	mA
Operating Current	I_{OP}	P0=200mW, 25°C P0=200mW, 55°C		330 440	380 490	mA
Operating Voltage	V_{OP}	P0=200mW, 55°C	---	1.6	2	V
Series Resistance	R_s	CW, $I_{op} = I_{th}$+30mA	---	1.3	3	Ohm
Slope Efficiency	SE	CW, $I_{op} = I_{th}$+30mA	---	0.6	---	mW/mA
Power Kink<*1>	Kink	Range [100~500]mA, CW			20	%
Side Mode Suppression Ratio	SMSR	T_c= 25°C ~ +75°C	35	---	---	dB
Peak Wavelength	λ	CW, P0=200mW, T_c= 25°C ~ +75°C	1300	1310	1320	nm
Wavelength Temperature Coefficient	Δλ/ΔT	T_{op} = -5°C ~ +75°C	---	0.095	---	nm/°C
Beam Divergence	Θ_v	FWHM @Po=200mW	---	26	---	degree
	Θ_h		---	22	---	
Relative Intensity Noise	RIN_f	Po=200mW	---	---	-130	dB/Hz

<*1> Kink is indicated in the light/current slope(dL/dI). The maximum magnitude of the kink point would be checked.

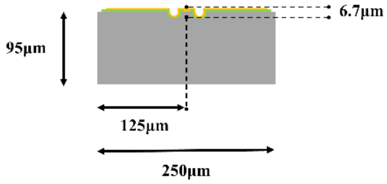
Electrical and Optical overstress (ESD/EOS) Information

- The Laser chips should be capable of withstanding an ESD voltage of 500 volts (CLASS III) with no permanent degradation in performance or reliability.
- Switching transients can cause electrical overstress (EOS) damage to the Laser chips. EOS may result from improper ESD handling, improper power sequencing, a faulty power supply or an intermittent connection.

Outline Dimension



Because the active region is designed in the center, the left and right pads can be swapped according to usage.



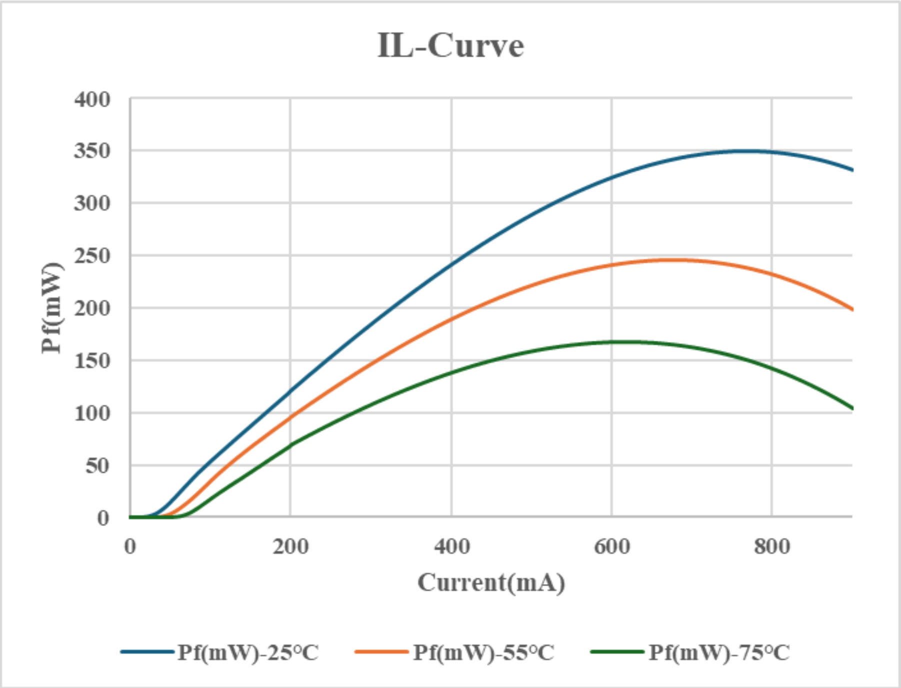
Chip configuration:

1. Top contact: anode; Bottom contact: cathode.
2. Dimension: 250 µm (width) x 1500 µm (cavity length) x 95 µm (thickness)

Tolerance: 95 ± 10 µm (Thickness)

± 20 µm (Width, Length)

IL Curve (Chip Level)



Order Information

P/N	Description	NOTE
WCH-C31E-T20	1310nm Edge-Emitting DFB Laser Diode Chip 200mW @55°C	V250X1500

Modification History

Revision	Date	Description	Originator	Review	Approved
V1.0	6-Aug-2025	New Issue	Char Ho	Sam Yen	Cliff Wang

Laser Safety

WARNING: Integration of this laser chip into a higher-level assembly or sub-assembly can result in a product which has radiation levels up to Class IIIb per CDRH, 21 CFR 1040. The actual light output and safety rating in operation will be a function of the installation and conditions under which it is used, including but not limited to the bonding method, heat sinking, thermal environment, and optical coupling design.

DANGER: Eye safety limits may be exceeded. The laser should then be treated as a class IIIb laser and as a potential eye hazard.