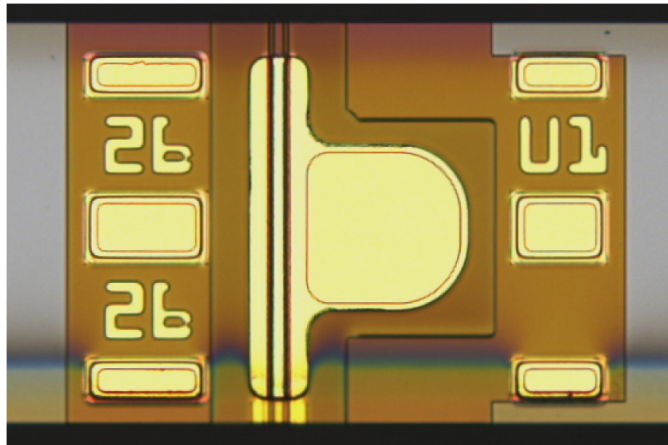


# 1300 nm 28 Gbps NRZ AND 56 Gbps PAM4 CWDM4 DFB LASER DIODE CHIPS

IND02Dn00D102



## FEATURES

- Designed for uncooled 28 Gb/s NRZ and 56 Gb/s PAM4
- Qualified according to GR-468 for use in non-hermetic packages
- Excellent reliability
- Top anode and backside cathode configuration
- RoHS compliant
- Available wavelengths
  - CWDM 1270 nm to 1330 nm

## APPLICATIONS

- Fiber optic communication links
- Gigabit Ethernet and storage area networks
- 5G Wireless front-haul datalinks

## SHIPMENT PACKAGING

- Chips on clear tape with grip ring  $\varnothing$  150 mm

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## Electro-Optical Characteristics

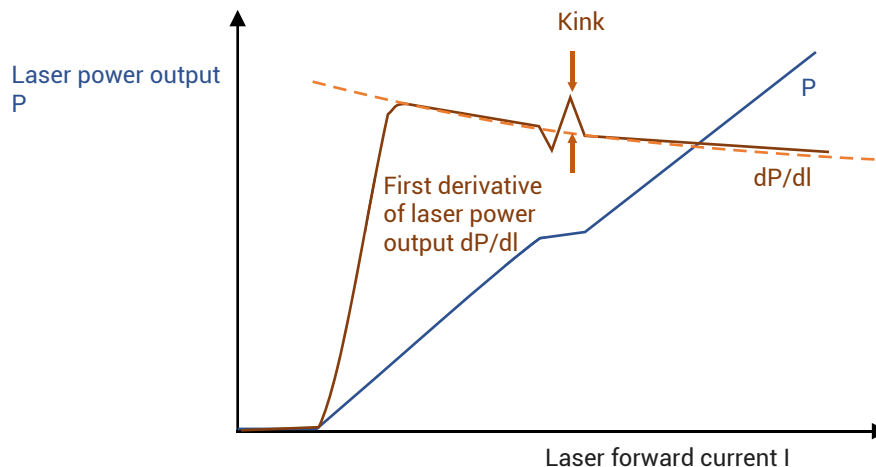
Operating condition:  $T_c = 0$  to  $85^\circ\text{C}$  and all values are at BOL unless otherwise specified

Parameter	Symbol	Conditions	Min	Typical	Max	Unit
Threshold Current	$I_{th}$	$85^\circ\text{C}$		11	19	mA
		$25^\circ\text{C}$		5		
Slope Efficiency	SE		0.1	0.2		W/A
Slope Efficiency Ratio	$SE_{0C}/SE_{85C}$				4	
Average Bias Current	$I_{op}$	BOL			60	mA
		EOL			72	mA
Operating Voltage	$V_f$	$P_o = 5$ mW			1.6	V
Differential Resistance	R	$P_o = 5$ mW		7	10	Ohm
Modulation Baud Rate	Gbaud			25		Gb/s
Output Optical Power	$P_o$	60 mA	5.5			mW
Front/Back Output Power Ratio	$P_f/P_b$		5.3		35	
Side Mode Suppression Ratio	SMSR	DC bias current: $I_{th} + 35$ mA to 60 mA and (Note 1)	30			dB
Center Wavelength	$\lambda$	see table below				
Wavelength Temperature Coefficient	$d\lambda/dT$			0.09	0.1	nm/ $^\circ\text{C}$
Beam Divergence (Horizontal)	$\theta_H$	FWHM		30	40	degree
Beam Divergence (Vertical)	$\theta_V$	FWHM		35	50	degree
Relative Intensity Noise (RIN)	RIN				-132	dB/Hz <sup>1/2</sup>
Kink		$I_{th} + 5$ mA ~ 90 mA (Figure 1)			15	%
Bandwidth	$f_{3dB}$	$I = 60$ mA $85^\circ\text{C}$	18	20		GHz

Note 1: We perform SMSR measurements at chip level under certain pre-defined conditions and with production specs. In applications, the SMSR, like all of other parameters in this table, 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 this table can be expected.

Figure 1 Kink definition

Kink = max deviation from fit line / average slope (%)



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## Available Wavelengths

PN for NRZ	Channel	Symbol	Conditions	Min	Typ	Max	Unit
IND02D000D102	CWDM-L0	$\lambda$	0 °C to 85 °C	1264.50	1271.00	1277.50	nm
IND02D100D102	CWDM-L1			1284.50	1291.00	1297.50	nm
IND02D200D102	CWDM-L2			1304.50	1311.00	1317.50	nm
IND02D300D102	CWDM-L3			1324.50	1331.00	1337.50	nm

## Absolute Maximum Ratings

Parameter	Symbol	Condition	Max Rating	Unit
Laser Bias Current (DC)	I <sub>max</sub>		80	mA
Peak Current	I <sub>peak</sub>		120	mA
Operating Relative Humidity	RH%		85	
Reverse Voltage	VR		2	V

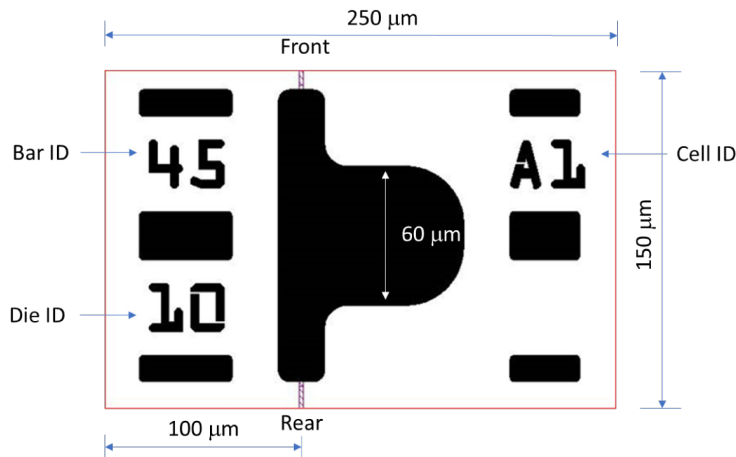
## Environmental Exposure Ratings (Bare dies)

Parameter	Symbol	Condition	Max Rating	Unit
Operating Temperature	Top		0 to +85	°C
Storage Temperature	T <sub>stg</sub>		-40 to +100	°C
Storage Relative Humidity	RH%		85	
Die Attach Temperature		Max 10 sec.	320	°C
ESD (HBM)	-		375	V

## Chip Dimensions

Parameter	Min	Typical	Max	Unit
Chip width	230	250	270	μm
Chip length	130	150	170	μm
Chip thickness	80	85	90	μm
Bond pad width	64.5	65		μm
Bond pad length	59.5	60		μm

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## RoHS Compliance

Coherent is fully committed to environment protection and sustainable development and has set in place a comprehensive program for removing polluting and hazardous substances from all of its products. The relevant evidence of RoHS compliance is held as part of our controlled documentation for each of our compliant products. RoHS compliance parts are available to order, please refer to the ordering information section for further details.

## Ordering Information

Product Code	Wavelength	Description	Shipment Packaging
IND02D000D102	1271.0 nm	56 Gb/s PAM4 Die	Chips on Grip ring <sup>(1)</sup>

<sup>(1)</sup> Clear tape on grip ring Ø 150mm (standard high volume)

## Important Notice

Performance figures, data and any illustrative material provided in this data sheet are typical and must be specifically confirmed in writing by Coherent before they become applicable to any particular order or contract. In accordance with the Coherent policy of continuous improvement specifications may change without notice. Further details are available from any Coherent sales representative.



## Regulatory Compliance and Safety Warnings

- These laser components produce invisible radiation at wavelengths of 1270 nm - 1370 nm.
- Avoid direct eye exposure.
- This laser component is not serviceable.
- Caution – Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.
- This laser component is designated for use solely to be incorporated into a finished laser product. The finished laser product must be evaluated and certified to the relevant laser safety standards. This laser component does not comply with 21CFR1040.10 or IEC 60825-1:2014.