

1300 nm 28 Gbps NRZ I-TEMPERATURE DFB LASER DIODE CHIPS

IND02Bn00D104



FEATURES

- Designed for uncooled 28 Gb/s NRZ operating -40 to 90 °C
- Qualified according to GR-468 for use in nonhermetic packages
- Excellent reliability
- Top anode and backside cathode configuration
- RoHS compliant
- Available wavelengths
 - 1270 nm, 1310 nm, and 1330 nm

APPLICATIONS

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

SHIPMENT PACKAGING

- Tested and Inspected chips on clear tape with grip ring
Ø 150mm

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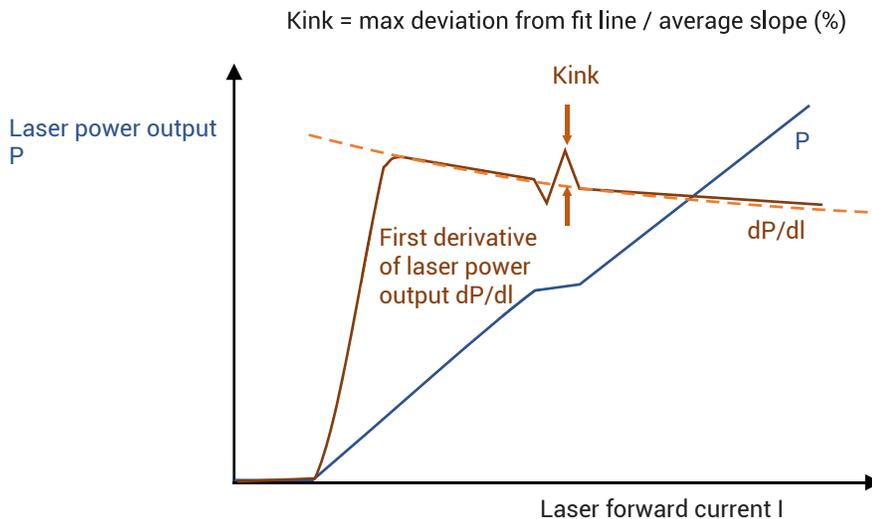
Electro-Optical Characteristics

Operating condition: $T_c = -40$ to 90 °C and all values are at BOL unless otherwise specified

| Parameter | Symbol | Conditions | Min | Typical | Max | Unit |
|------------------------------------|--------------------|--|-----|---------|------|----------------------|
| Threshold Current | I_{th} | 85 °C | | 11 | 19 | mA |
| | | 25 °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 | |
| 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: $I_{th} + 5$ mA to 60 mA and (Note 1) | 30 | | | dB |
| Center Wavelength | λ | See table below. DC bias current: 30 mA to 60 mA | | | | |
| Wavelength Temperature Coefficient | $d\lambda/dT$ | | | | 0.09 | nm/°C |
| Beam Divergence (Horizontal) | θ_H | FWHM | | 30 | 40 | degree |
| Beam Divergence (Vertical) | θ_V | FWHM | | 35 | 50 | degree |
| Relative Intensity Noise (RIN) | RIN | | | | -132 | dB/Hz ^{1/2} |
| Kink | | $I_{th} + 5$ mA ~ 90 mA (Figure 1) | | | 15 | % |
| Bandwidth | f_{3dB} | $I = 60$ mA | 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



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Available Wavelengths

| PN | Channel | Symb | Conditions | Min | Typ | Max | Unit |
|---------------|---------|------|---------------|------|------|------|------|
| IND02B000D104 | B0 | λ | -40°C to 90°C | 1256 | 1271 | 1286 | nm |
| IND02B100D104 | B1 | | | 1296 | 1311 | 1326 | nm |
| IND02B200D104 | B2 | | | 1315 | 1331 | 1346 | nm |

Absolute Maximum Ratings

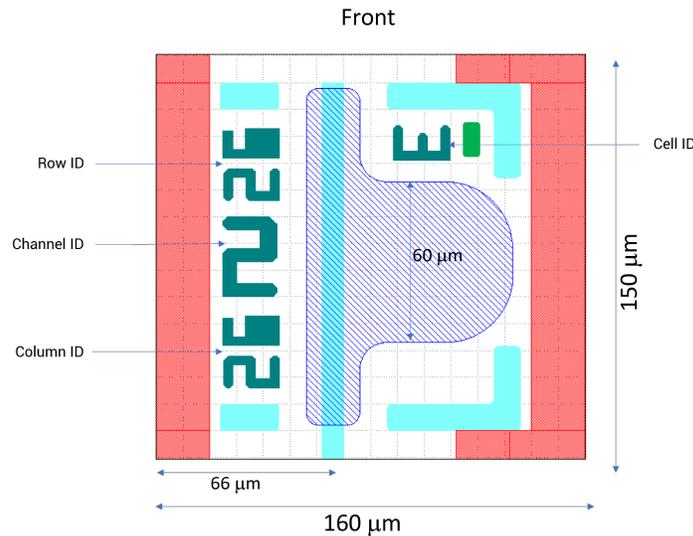
| Parameter | Symbol | Condition | Max Rating | Unit |
|-----------------------------|-------------------|-----------|------------|------|
| Laser Bias Current (DC) | I _{max} | | 80 | mA |
| Peak Current | I _{peak} | | 120 | mA |
| Operating Relative Humidity | RH% | | 85 | |
| Reverse Voltage | VR | | 2 | V |

Environmental Exposure Ratings (Bare dies)

| Parameter | Symbol | Condition | Max Rating | Unit |
|---------------------------|------------------|-------------|-------------|------|
| Operating Temperature | T _{op} | | -40 to 90 | °C |
| Storage Temperature | T _{stg} | | -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 | 140 | 160 | 180 | 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 |
|---------------|------------|-----------------|-----------------------------------|
| IND02B000D104 | 1271 nm | 28 Gb/s NRZ Die | Chips on Grip ring ⁽¹⁾ |

⁽¹⁾ 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 - 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.