

940nm 2W VCSEL Chip VC-0940P-002W-40-3A0

Features

- 940nm single wavelength
- Low wavelength drift
- Oxide isolation technology
- Low threshold current
- High reliability
- Easy to collimate

Applications

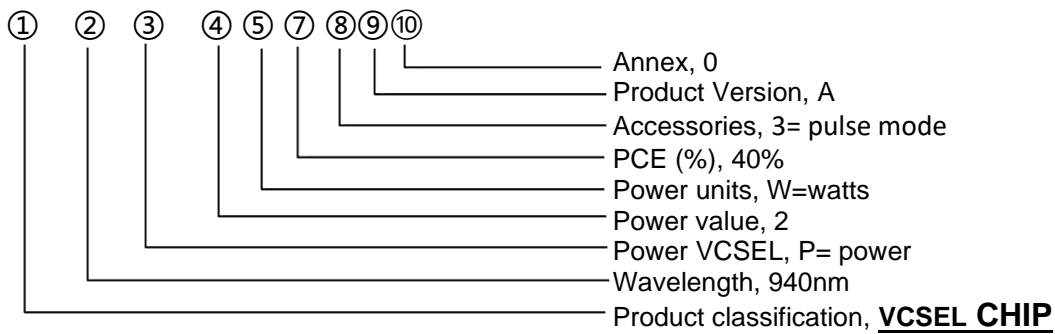
- 3D sensors
- Lidars
- IR illuminations
- Medical applications
- Proximity sensors
- Military applications

PRODUCT IDENTIFY

| Part Number | Description |
|----------------------|---------------------|
| VC-0940P-002W-40-3A0 | 940nm 2W VCSEL Chip |

CODE RULES

VC - 0940 P - 002W - 40 - 3 A 0



I. Absolute maximum ratings

| Parameter | Symbol | Rating | Unit |
|---------------------------------|--------|------------|------|
| Operating Temp | Top | -40 to 85 | °C |
| Storage Temp | Tsto | -40 to 85 | °C |
| Reflow Soldering Temperature | Tsdr | 320°C(10s) | °C |
| Reverse Voltage | Vr | 5 | V |
| Maximum Continuous Current | Imax | 10 | A |
| ESD exposure (Human body) model | ESD | 1K | V |

Note:

1. Stresses greater than those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or other conditions above those indicated in the operations section for extended periods of time may affect reliability.
2. In its maximum rating diode laser operation could damage its performance or cause potential safety hazard such as equipment failure.

- Electrostatic discharge is the main reason for the laser fault of the diode. Take effective precautions against ESD. When dealing with laser diodes, use the wrist strap, grounding work surface and strict antistatic technology.

II. Optical-electrical characteristics @25°C (pulsewidth 0.1ms, 1% duty cycle)

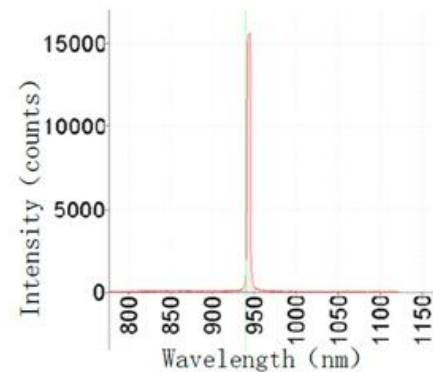
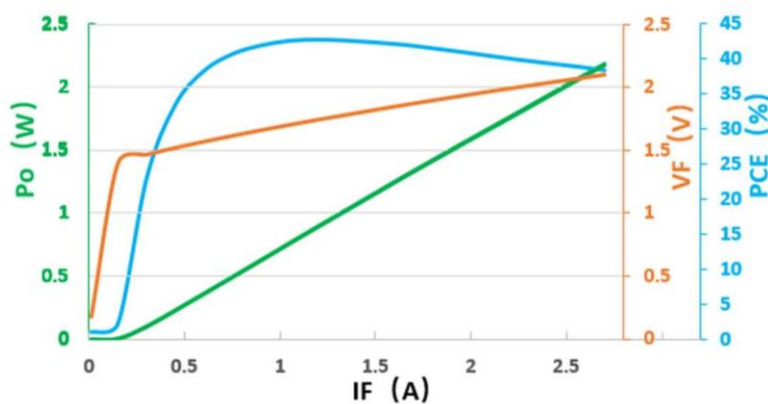
| Parameters | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|-----------------------------|----------|------------|------|------|----------|----------|
| Optical Power | P_o | $I_F=2.5A$ | - | 2.0 | - | W |
| Threshold Current | I_{TH} | - | - | 0.5 | - | A |
| Forward Current | - | - | - | 3.0 | - | A |
| Power Conversion Efficiency | η | - | 38 | 40 | 42 | % |
| Slope Efficiency | - | - | 0.87 | - | - | W/A |
| Peak Wavelength | - | $P_o=2W$ | 930 | 940 | 950 | nm |
| Laser Forward Voltage | V_F | $I_F=2.5A$ | - | 2.05 | 2.15 | V |
| Beam Angle | - | $I_F=2.5A$ | - | 20 | 25 | Degrees |
| Series Resistance | R | $I_F=2.5A$ | - | 0.9 | 0.94 | Ω |
| Wavelength Temp. Drift | - | $I_F=2.5A$ | - | 0.07 | - | nm/°C |
| Soldering Temperature | - | - | - | - | 320(10s) | °C |

Note: Electro-Optical Characteristic with a package or diffuser would require further evaluation. Values are based on limited sample size and estimated values.

III. Environmental Specifications

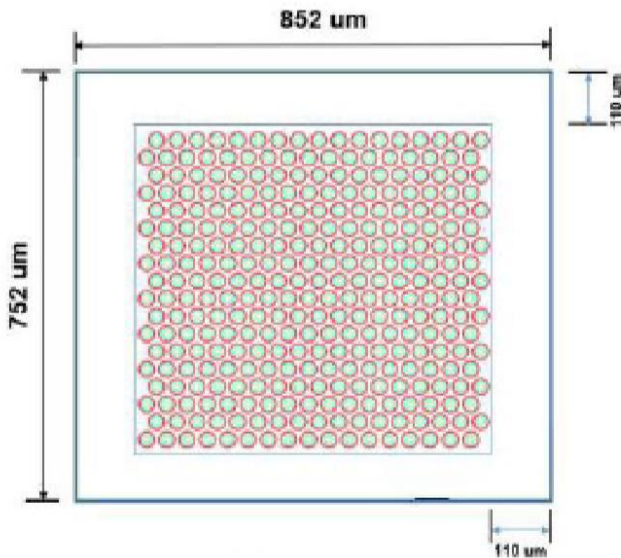
| Parameter | Symbol | Min. | Typ. | Max. | Units | Ref. |
|---------------------|--------|------|------|------|-------|------|
| Case Operating Temp | Top | -40 | 25 | 75 | °C | - |
| Storage Temp | Tsto | -40 | 25 | 85 | °C | - |

IV. LIV Graph



V. Mechanical Schematics (unit:mm)

Device: 300 aperture



Chip thickness =100um

Note: There may be some changes between sample and drawing, thus, the actual spec please refer to the sample that you received. And if any question please contact us.

VI. Packaging Suggestion

For packaging, the user should use high thermal conductive substrate with AlN or copper; the user also attaches die onto the substrate using high thermal conductive materials such as nanosilver gel or AuSn.

The user should have the equipments such as die attachment, wire bonder etc., which should be located in 1000 class clean room. For further assistance in need, please feel free to contact Brightintelligence! We would work with you to solve your issues.

VII. Treatment and protection measures

Soldering precautions

The operator should examine grounding of machines before die attachment; and operator should wear electrostatic bracelet to prevent die from damaging caused by electrostatic discharging.

Storage precautions

VCSEL bare dies must be stored in Nitrogen gas cabinet with >99% concentration at 20°C.

VIII. Revision history

| Revision | Date | Description |
|----------|------------|--------------------------------------|
| V.02 | 2020/02/24 | The first official edition (2C7,2C8) |
| V.03 | 2020/04/07 | Update part name |

**Brightlaser reserves the right to make modification at any time due to improved design from time to time, the merit behind is in order to supply the best product possible.