940nm 60mW VCSEL Diode

LD0940-B060-0020CC-XXXX

Features

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

Applications

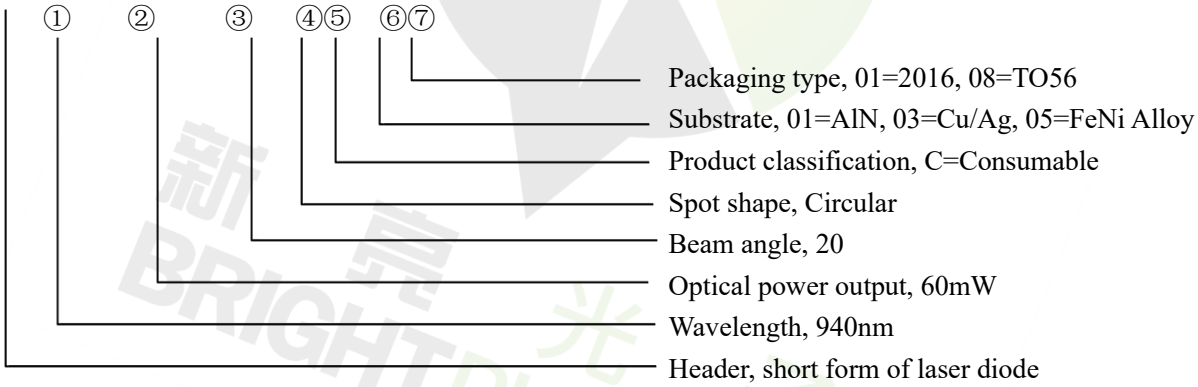
- 3D sensors
- Lidars
- IR illuminations
- Medical applications
- Proximity sensors

PRODUCT IDENTIFY

Part Number	Description
LD0940-B060-0020CC-XXXX	940nm 60mW VCSEL Diode

CODE RULES

e.g. LD0940 – B060 – 0020CC - XXXX



I. Absolute maximum ratings

Parameter	Symbol	Rating	Unit
Case Operating Temp	Top	-20 to 60	℃
Storage Temp	Tsto	-40 to 85	℃
Reflow Soldering Temperature	Tsdr	260℃(10s)	℃
Reverse Voltage	Vr	5	V
Maximum Continuous Current	Imax	100	mA
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.

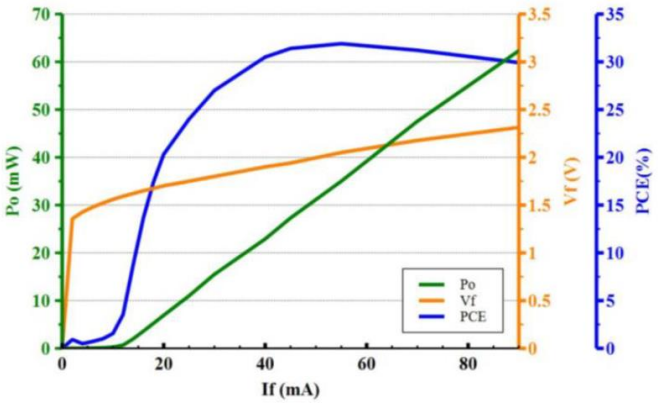
2. In its maximum rating diode laser operation could damage its performance or cause potential safety hazard such as equipment failure.
3. Electrostatic discharge is the main reason for the laser fault of the diode. Take effective precautions against ESD. When dealing with laser diodes, use the wrist strap, grounding work surface and strict antistatic technology.

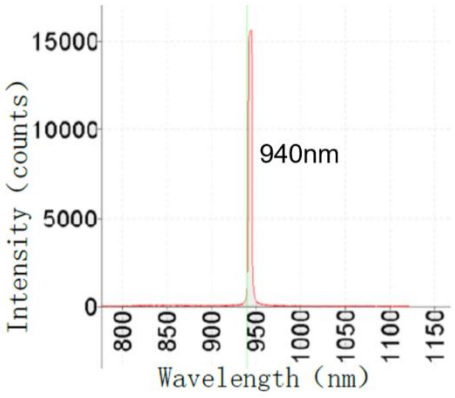
II. Optical-electrical characteristics @25℃ (CW Mode)

Parameters		Symbol	Conditions	Min.	Typ.	Max.	Units
Optical Power Output		P_o	I_F =88mA		60	-	mW
Threshold Current		I_{TH}	-	-	10	-	mA
Forward Current		-	-	-	88	-	mA
Slope Efficiency		η	Po =60mW	-	0.77	-	mW/mA
Power Conversion Efficiency		PCE	I_F =88mA	-	30	32	%
Peak Wavelength		λ_P	I_F =88mA	930	940	950	nm
Laser Forward Voltage		V_F	I_F =88mA	-	2.205	-	V
Series Resistance		R_S	I_F =88mA	-	7.45		Ω
Emission area		-	-	-	116*127	-	um
Beam Angle	(1/e^2)	θ	I_F =88mA	-	20	-	Degree
	FWHM	θ	-	-	-	-	Degree
Wavelength Temp. Drift		$\partial\lambda_P/\partial T$	I_F =88mA	-	-	0.07	nm/°C
Soldering Temperature		-	AlN FeNi Alloy	-		260(10s)	℃
			Cu/Ag	-		180(10s)	℃
Substrate		AlN, Cu/Ag, FeNi Alloy					

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

III. LIV Graph and Wavelength



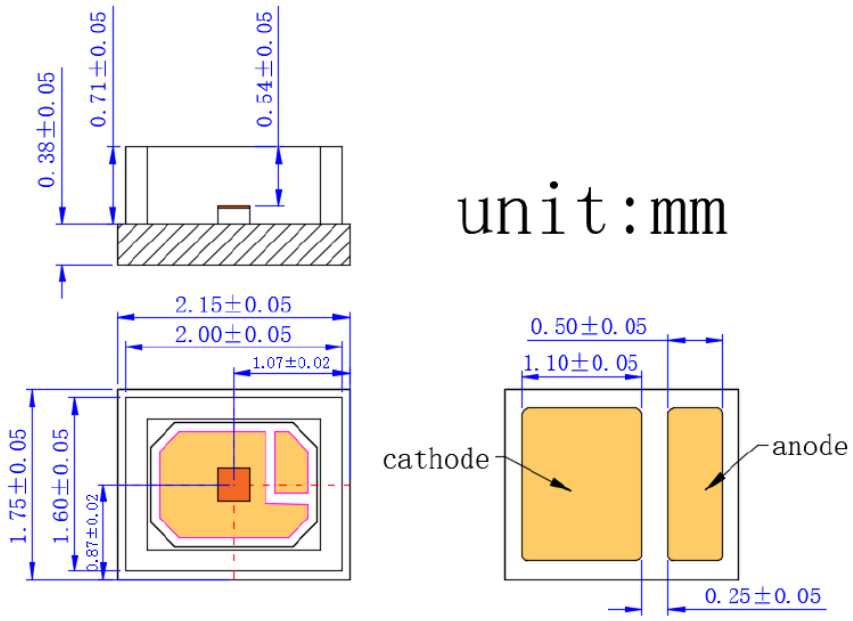


Note:

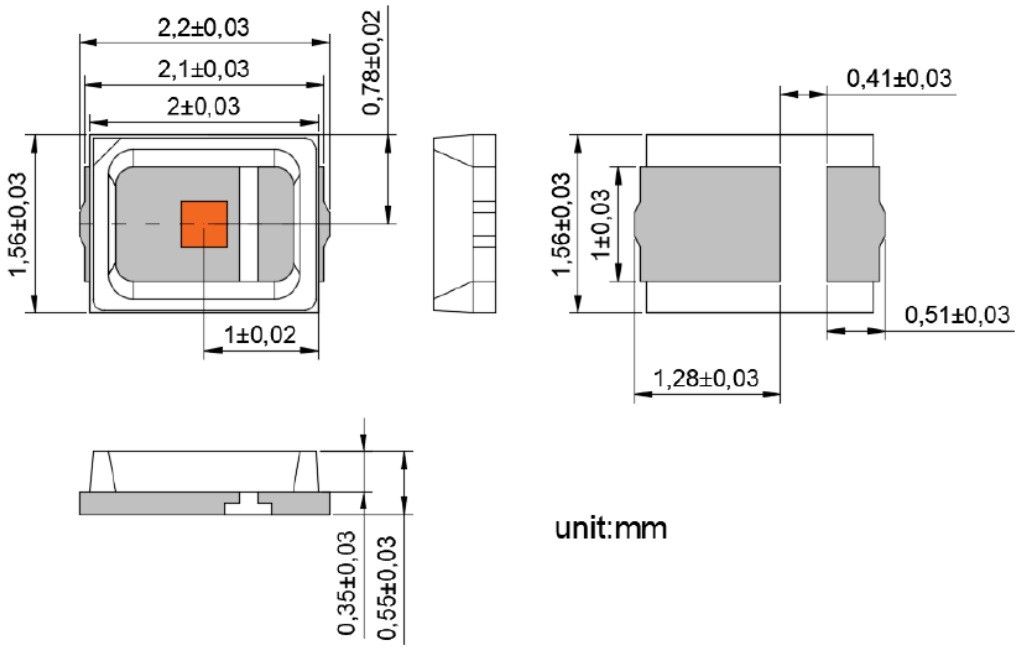
1. LIV graph was measured at 25 °C (left); power output, voltage and power conversion efficiency variation trend with changed operating temperature (right, normalized).
2. Forward Voltage (V_F) measurement allowance is ±0.1 V.
3. Peak Wavelength (λ_P) measurement allowance is ±1.5 nm.
4. Others measurement allowance is ±10%.

IV. Mechanical Schematics (unit:mm)

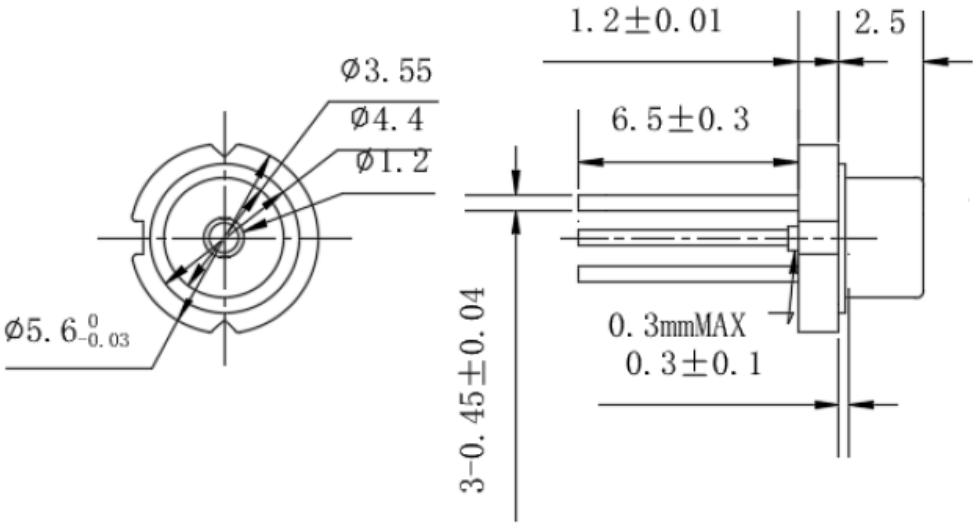
LD0940-B060-0020CC-0101 (Substrate AlN, Package 2016)

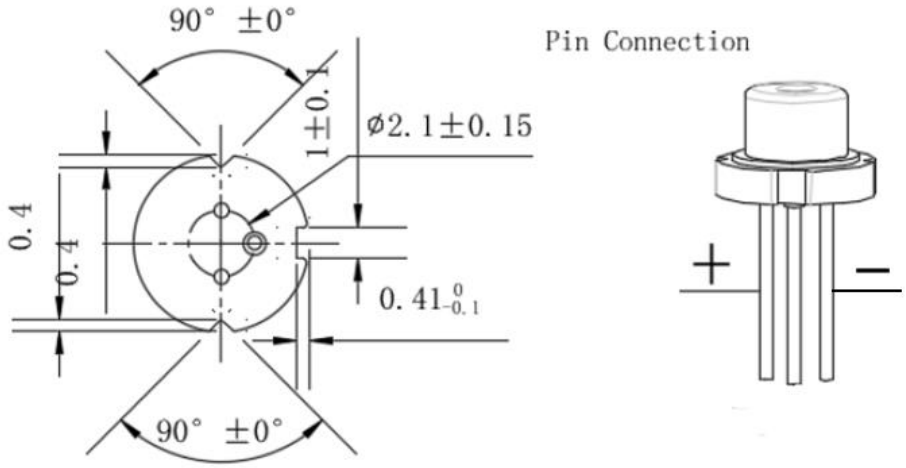


LD0940-B060-0020CC-0301 (Substrate Cu/Ag, Package 2016)



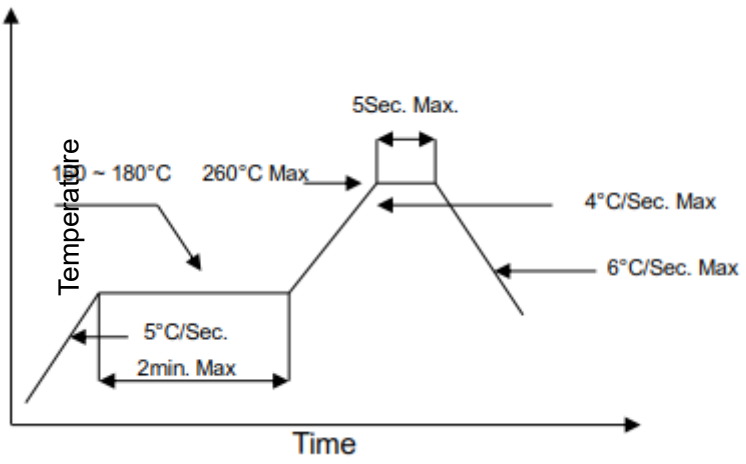
LD0940-B060-0020CC-0508 (Substrate FeNi Alloy, Package TO56)





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. SMT reflow soldering curve



Note: Reflow soldering can be operated only one time. During the temperature ramp-up, no forces may be exerted on the LD which could deform or damage them. After soldering completed, please also do not process until the product temperature ramp down to room temperature.

VII. Treatment and protection measures

Soldering precautions

For AlN and FeNi Alloy substrate, the temperature of soldering iron must be controlled under 260℃ during manual soldering; for Cu/Ag substrate, the temperature of soldering iron must be controlled under 180℃ during manual soldering. Also, VCSEL can be only soldered one time with the soldering time less than 3s. But, It is very hard to control the soldering temperature and homogenize solder paste because of the smaller size of VCSEL. In addition, it is easy to damage VCSEL structure even causes VCSEL losing efficacy. So, we advise you to use re-flow soldering machine for operation.

Storage precautions

Our products were sealed by aluminum foil bag attaching packed desiccant, they are moisture proof and anti-static. please handle these gently to avoid damage. At the same time, please be ready for storage and take some moisture-proof measures to keep VCSEL away from dampness that may causes reliability failure.

Before opening, VCSEL must be kept below 30℃ with 60%RH. Recommend for use within 90 days.

After opening, VCSEL must be kept in an environment that temperature lower than 30℃ and humidity lower than 60%RH and used up within 24 hours. When the storage humidity reaches and exceeds 60%, the products must be dehumidified at 60℃ for more than 24hours before use.

Others

1. Please use solder paste to cure the laser diode.
2. Please make sure that the heat of LD has been completely conducted to metal shell, to avoid affecting the optical power output.
3. This LD can be only used in constant voltage and current.
4. Operating voltage and current, refer to the table in paragraph II.
5. Please do not aim the laser to people or animal.
6. You can observe the laser spot through an image monitoring equipment.
7. Please do not touch LD surface by naked hands or squeeze the sealant on LD surface, or it may cause wrong optical angle and distorted laser spot, even damage the LD.
8. Please use ceramic suction nozzle to absorb the LD, so as to avoid LD sticking to the nozzle.
9. Please add a 0.02s blowing action after locating the laser diode to aluminum substrate.

Revision	Date	Description
V.01	2020/02/25	Official datasheet created
V.02	2020/10/20	Update spec data and VI
V.03	2020/11/21	Update package and address

**BrightPhoton 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.

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