CEL

LASER DIODE
NX5317 Series

1 310 nm FOR FTTH PON APPLICATION
InGaAsP MQW-FP LASER DIODE

DESCRIPTION

The NX5317 Series is a 1 310 nm Multiple Quantum Well (MQW) structured Fabry-Perot (FP) laser diode. These devices are designed for application up to 1.25 Gb/s.

APPLICATION

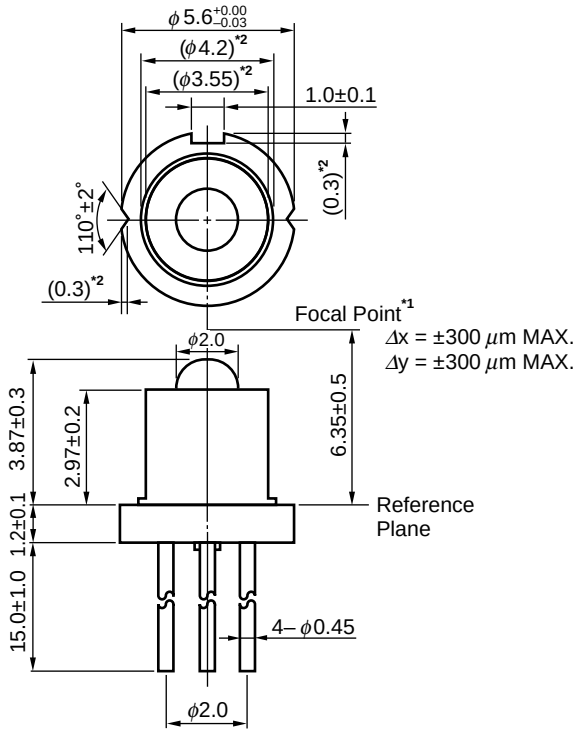
- FTTH PON (B-PON, GE-PON 10 km) system

FEATURES

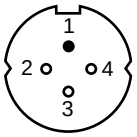
- Optical output power P_o = 15.0 mW
- Low threshold current I_{th} = 7 mA
- Differential Efficiency η_d = 0.5 W/A
- Wide operating temperature range T_C = –40 to +85°C
- InGaAs monitor PIN-PD (NX5317EH)
- CAN package ϕ5.6 mm
- Focal point 6.35 mm

Document No. PL10609EJ01V0DS (1st edition)
Date Published January 2007 NS CP(N)

PACKAGE DIMENSIONS (UNIT: mm)

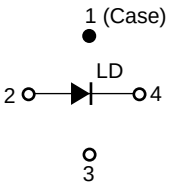


BOTTOM VIEW

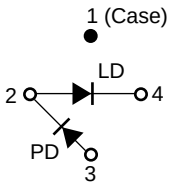


PIN CONNECTIONS

NX5317EE

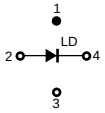
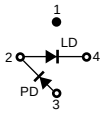


NX5317EH



***1** Focal Point: A point to get maximum optical output power from fiber.
***2** ( ) indicates nominal dimension.

ORDERING INFORMATION

Part Number	Package	Pin Connections
NX5317EE-AZ*	4-pin CAN with ball lens cap	
NX5317EH-AZ*		

***Note** Please refer to the last page of this data sheet “Compliance with EU Directives for Pb-Free RoHS Compliance Information.

Remarks 1. The color of ball lens cap might be observed differently.

2. The hermetic test will be performed as AQL 1.0%.

ABSOLUTE MAXIMUM RATINGS – NX5317EE –

Parameter	Symbol	Ratings	Unit
Optical Output Power	P_o	23	mW
Forward Current of LD	I_F	150	mA
Reverse Voltage of LD	V_R	2.0	V
Operating Case Temperature	T_C	–40 to +85	°C
Storage Temperature	T_{stg}	–40 to +85	°C
Assembly Temperature	T_{asb}	150 (15 Hr)	°C
Lead Soldering Temperature	T_{sld}	350 (3 sec.)	°C
Relative Humidity (noncondensing)	RH	85	%

ELECTRO-OPTICAL CHARACTERISTICS (T_C = 25°C, CW, unless otherwise specified) – NX5317EE –

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Operating Voltage	V_{op}	P_o = 15.0 mW		1.1	1.5	V
Threshold Current	I_{th}			7	15	mA
Differential Efficiency	η_d		0.46	0.50		W/A
Center Wavelength	λ_C	P_o = 15.0 mW, RMS (–20 dB)	1 297	1 308	1 319	nm
Spectral Width	σ	P_o = 15.0 mW, RMS (–20 dB)		1.2	2.0	nm
Rise Time	t_r	10-90%		0.15	0.3	ns
Fall Time	t_f	90-10%		0.15	0.3	ns
Fiber Coupling Power	P_f	P_o = 15.0 mW, optimized coupling with 8 degree angled SMF		2.3		mW
Focal Distance	D_f		5.85	6.35	6.85	mm

ABSOLUTE MAXIMUM RATINGS – NX5317EH –

Parameter	Symbol	Ratings	Unit
Optical Output Power	P_o	23	mW
Forward Current of LD	I_F	150	mA
Reverse Voltage of LD	V_R	2.0	V
Forward Current of PD	I_F	10	mA
Reverse Voltage of PD	V_R	20	V
Operating Case Temperature	T_C	–40 to +85	°C
Storage Temperature	T_{stg}	–40 to +85	°C
Assembly Temperature	T_{asb}	150 (15 Hr)	°C
Lead Soldering Temperature	T_{sld}	350 (3 sec.)	°C
Relative Humidity (noncondensing)	RH	85	%

ELECTRO-OPTICAL CHARACTERISTICS (T_C = 25°C, CW, unless otherwise specified) – NX5317EH –

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Operating Voltage	V_{op}	P_o = 15.0 mW		1.1	1.5	V
Threshold Current	I_{th}			7	15	mA
Differential Efficiency	η_d		0.46	0.50		W/A
Center Wavelength	λ_C	P_o = 15.0 mW, RMS (–20 dB)	1 297	1 308	1 319	nm
Spectral Width	σ	P_o = 15.0 mW, RMS (–20 dB)		1.2	2.0	nm
Rise Time	t_r	10-90%		0.15	0.3	ns
Fall Time	t_f	90-10%		0.15	0.3	ns
Monitor Current	I_m	V_R = 1.5 V, P_o = 15.0 mW	100	150	500	μA
Monitor Dark Current	I_D	V_R = 10 V			100	nA
Monitor PD Terminal Capacitance	C_t	V_R = 10 V, f = 1 MHz		5	20	pF
Fiber Coupling Power	P_f	P_o = 15.0 mW, optimized coupling with 8 degree angled SMF		2.3		mW
Focal Distance	D_f		5.85	6.35	6.85	mm

REFERENCE

Document Name	Document No.
Opto-Electronics Devices Pamphlet	PX10160E

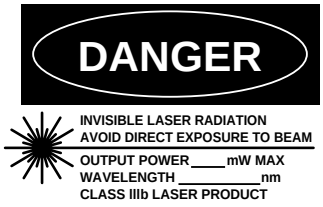
- **The information in this document is current as of January, 2007. The information is subject to change without notice. For actual design-in, refer to the latest publications of NEC Electronics data sheets or data books, etc., for the most up-to-date specifications of NEC Electronics products. Not all products and/or types are available in every country. Please check with an NEC Electronics sales representative for availability and additional information.**
- No part of this document may be copied or reproduced in any form or by any means without the prior written consent of NEC Electronics. NEC Electronics assumes no responsibility for any errors that may appear in this document.
- NEC Electronics does not assume any liability for infringement of patents, copyrights or other intellectual property rights of third parties by or arising from the use of NEC Electronics products listed in this document or any other liability arising from the use of such products. No license, express, implied or otherwise, is granted under any patents, copyrights or other intellectual property rights of NEC Electronics or others.
- Descriptions of circuits, software and other related information in this document are provided for illustrative purposes in semiconductor product operation and application examples. The incorporation of these circuits, software and information in the design of a customer's equipment shall be done under the full responsibility of the customer. NEC Electronics assumes no responsibility for any losses incurred by customers or third parties arising from the use of these circuits, software and information.
- While NEC Electronics endeavors to enhance the quality, reliability and safety of NEC Electronics products, customers agree and acknowledge that the possibility of defects thereof cannot be eliminated entirely. To minimize risks of damage to property or injury (including death) to persons arising from defects in NEC Electronics products, customers must incorporate sufficient safety measures in their design, such as redundancy, fire-containment and anti-failure features.
- NEC Electronics products are classified into the following three quality grades: "Standard", "Special" and "Specific".
  The "Specific" quality grade applies only to NEC Electronics products developed based on a customer-designated "quality assurance program" for a specific application. The recommended applications of an NEC Electronics product depend on its quality grade, as indicated below. Customers must check the quality grade of each NEC Electronics product before using it in a particular application.
  "Standard": Computers, office equipment, communications equipment, test and measurement equipment, audio and visual equipment, home electronic appliances, machine tools, personal electronic equipment and industrial robots.
  "Special": Transportation equipment (automobiles, trains, ships, etc.), traffic control systems, anti-disaster systems, anti-crime systems, safety equipment and medical equipment (not specifically designed for life support).
  "Specific": Aircraft, aerospace equipment, submersible repeaters, nuclear reactor control systems, life support systems and medical equipment for life support, etc.

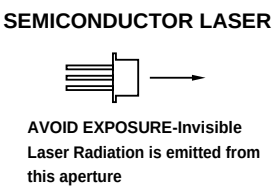
The quality grade of NEC Electronics products is "Standard" unless otherwise expressly specified in NEC Electronics data sheets or data books, etc. If customers wish to use NEC Electronics products in applications not intended by NEC Electronics, they must contact an NEC Electronics sales representative in advance to determine NEC Electronics' willingness to support a given application.

(Note)
(1) "NEC Electronics" as used in this statement means NEC Electronics Corporation and also includes its majority-owned subsidiaries.
(2) "NEC Electronics products" means any product developed or manufactured by or for NEC Electronics (as defined above).

M8E 02. 11-1

SAFETY INFORMATION ON THIS PRODUCT





Warning Laser Beam	A laser beam is emitted from this diode during operation. The laser beam, visible or invisible, directly or indirectly, may cause injury to the eye or loss of eyesight. • Do not look directly into the laser beam. • Avoid exposure to the laser beam, any reflected or collimated beam.
Caution GaAs Products	This product uses gallium arsenide (GaAs). GaAs vapor and powder are hazardous to human health if inhaled or ingested, so please observe the following points. • Follow related laws and ordinances when disposing of the product. If there are no applicable laws and/or ordinances, dispose of the product as recommended below. 1. Commission a disposal company able to (with a license to) collect, transport and dispose of materials that contain arsenic and other such industrial waste materials. 2. Exclude the product from general industrial waste and household garbage, and ensure that the product is controlled (as industrial waste subject to special control) up until final disposal. • Do not burn, destroy, cut, crush, or chemically dissolve the product. • Do not lick the product or in any way allow it to enter the mouth.

CEL California Eastern Laboratories

4590 Patrick Henry Drive
Santa Clara, CA 95054-1817
Telephone: (408) 919-2500
Facsimile: (408) 988-0279

Subject: Compliance with EU Directives

CEL certifies, to its knowledge, that semiconductor and laser products detailed below are compliant with the requirements of European Union (EU) Directive 2002/95/EC Restriction on Use of Hazardous Substances in electrical and electronic equipment (RoHS) and the requirements of EU Directive 2003/11/EC Restriction on Penta and Octa BDE.

CEL Pb-free products have the same base part number with a suffix added. The suffix –A indicates that the device is Pb-free. The –AZ suffix is used to designate devices containing Pb which are exempted from the requirement of RoHS directive (*). In all cases the devices have Pb-free terminals. All devices with these suffixes meet the requirements of the RoHS directive.

This status is based on CEL's understanding of the EU Directives and knowledge of the materials that go into its products as of the date of disclosure of this information.

Restricted Substance per RoHS	Concentration Limit per RoHS (values are not yet fixed)	Concentration contained in CEL devices	
Lead (Pb)	< 1000 PPM	-A	-AZ
		Not Detected	(*)
Mercury	< 1000 PPM	Not Detected	
Cadmium	< 100 PPM	Not Detected	
Hexavalent Chromium	< 1000 PPM	Not Detected	
PBB	< 1000 PPM	Not Detected	
PBDE	< 1000 PPM	Not Detected	

If you should have any additional questions regarding our devices and compliance to environmental standards, please do not hesitate to contact your local representative.