

NEC ELECTRONICS FIBER OPTIC DEVICES — 2009



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## HOW WE FIT INTO THE PICTURE

**CEL offers a broad portfolio of lasers and detectors from NEC Electronics' Compound Semiconductor Device Division (CSDD). They support a wide range of applications including telecommunications, data communications, FTTx, CATV, and OTDR testing.**

**We offer Fabry-Perot and DFB lasers, plus PIN and APD detectors that utilize CSDD's core strengths: AlGaInAs buried hetero-structure laser die, AlInAs APD, and WAVE technology for precise grating formation.**

**Both NEC Electronics and CEL are committed to the environment and are continually seeking new materials and methods of doing business that are environmentally responsible. You'll find that all CSDD laser and detector devices are designed to meet RoHS compliance requirements.**

- **Telecom**
- **Datacom**
- **OTDR**
- **CATV**
- **FTTx**

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# 10G DFB TOSA & PIN ROSA

**NEC Electronics TOSA and ROSA devices for OC-192 (2 to 40 km), 10GBASE-LR, and 10G Fibre Channel applications**

## FEATURES

### TOSA

- AlGaInAs DFB fabricated using Al oxidation-free all-selective MOVPE without semiconductor etching
- Outstanding performance over wide temperature range:  $-20^{\circ}$  to  $+95^{\circ}\text{C}$
- Low threshold and operating current
- Differential models with flex
- SC or LC receptacle



### ROSA

- Integrated 3.3V low noise pre-amplifier
- Wide temperature range:  $-5^{\circ}$  to  $+95^{\circ}\text{C}$
- AC-coupled differential output
- $-20\text{dBm}$  typical sensitivity
- Plastic package with flex
- SC or LC receptacle
- Pigtail package available



## TOSA MODELS

Part Number	Application
<b>NX8342 Series</b>	OC-192 IR-1
<b>NX8346 Series</b>	OC-192 SR, 10GBASE-LR

## ROSA MODELS

Part Number	Application
<b>NR3313 Series</b>	OC-192 SR, IR-1, LR-1
<b>NR3314 Series</b>	10GBASE-LR
<b>NR3315 Series*</b>	OC-192 SR, IR-1, LR-1

*\*Pigtail Package*

10G TOSA/ROSA

## 10G FP TOSA & MM PIN ROSA

**NEC Electronics TOSA and ROSA devices  
for 10GBASE-LRM applications**

### FEATURES

#### **NX7323 Series TOSA**

- AlGaInAs FP fabricated using Al oxidation-free all-selective MOVPE without semiconductor etching
- Wide temperature range:  $-25^{\circ}$  to  $+95^{\circ}\text{C}$
- Differential drive with flex
- SC or LC receptacle

#### **NR3421 Series ROSA**

- Built-in 3.3V linear TIA
- Wide temperature range:  $-25^{\circ}$  to  $+95^{\circ}\text{C}$
- Plastic package with flex
- SC or LC receptacle



10G TOSA/ROSA

## 10G APD ROSA

### NEC Electronics InAlAs APD receiver with internal pre-amplifier

#### FEATURES

- Best-in-Class sensitivity:  $-28\text{dBm}$  typ
- Integrated 3.3V low noise pre-amplifier
- On-board threshold-adjust TIA available
- Choice of packages:

*ROSA package for XFP transceivers*

*Pigtail package for 300 pin transponders  
and system line cards*



#### MODELS

Part Number	Note
<b>NR4210 Series</b>	Without threshold-adjust TIA
<b>NR4211 Series</b>	With threshold-adjust TIA
<b>NR4212 Series</b>	With AGC & threshold-adjust TIA

10G APD ROSA

## 2.5G DWDM DML Lasers

Ideally suited for digital transmission at 1550 nm

### FEATURES

#### TOSA

- 18.5 mm package with LC receptacle
- Built-in Mini-TEC with low power consumption
- -20 to +85°C temperature range
- High power version available

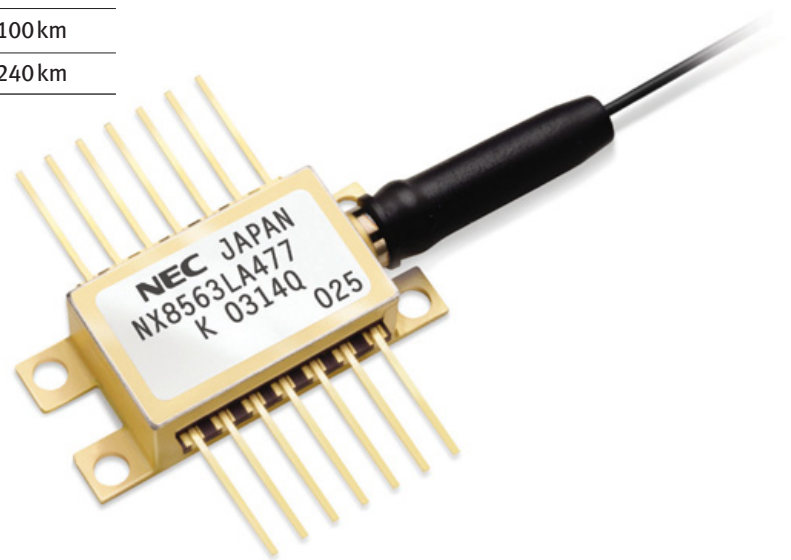
#### BUTTERFLY

- Single-mode fiber, SC-APC connector
- Internal isolator and thermoelectric cooler
- -20 to +85°C temperature range



### MODELS

Part Number	Package	Output Power	Distance
<b>NX8530NH</b>	TOSA	Up to 4 dBm	100 km
<b>NX8531NH</b>	TOSA	Above 4 dBm	240 km
<b>NX8563LAS</b>	Butterfly	Up to 4 dBm	100 km
<b>NX8563LA</b>	Butterfly	Above 4 dBm	240 km



2.5G DWDM DML

## 2.5G & 4G DFB TOSA & APD ROSA

### NEC Electronics 2.5G and 4G devices for SFP transceivers

#### FEATURES

- $\phi$ 3.8mm TOSA and  $\phi$ 4.6mm ROSA with LC receptacle designed for SFF/SFP transceivers
- Fiber Stub design prevents back reflection, making transmission more stable and reliable
- 1310nm, 1550nm and CWDM DFB models
- APD detector with 3.3V low noise pre-amplifier
- High sensitivity:  $-35$  dBm typ.
- DC-coupled differential output



#### MODELS

##### DFB TOSA

Part Number	Application
<b>NX8313UD</b>	OC-48 (LR-1)
<b>NX8510UDxx</b>	OC-48, 80km CWDM
<b>NX8511UD</b>	OC-48 (LR-2)

##### APD ROSA

Part Number	Application
<b>NR4512 Series</b>	OC-48
<b>NR4513 Series*</b>	OC-48
<b>NR4540 Series</b>	4G

\*Plastic Receptacle

2.5G & 4G TOSA/ROSA



## High Power Pulsed FP Lasers for OTDR

NEC Electronics cooled and uncooled lasers for mainframe and portable OTDR test equipment and subassemblies

### FEATURES

#### For mainframes

- 1310, 1550 and 1625 nm models
- Internal thermoelectric coolers
- Hermetically-sealed DIP packages

#### For portable test equipment

- New uncooled coaxial packages with monitor photodiode
- Low cost uncooled coaxial packages
- Excellent stability over temperature

#### For subassemblies

- Uncooled CAN packages
- 1310 and 1550 nm models



### MODELS

#### Cooled Lasers in DIP Packages

Part Number	Wavelength	Output Power
<b>NX7363JB</b>	1310nm	150mW min
<b>NX7563JB</b>	1550nm	135mW min
<b>NX7663JB</b>	1625nm	120mW min

#### Uncooled Lasers in Coaxial Packages

Part Number	Wavelength	Output Power
<b>NX7337BF-AA</b>	1310nm	110mW min
<b>NX7337BJ-AA*</b>	1310nm	110mW min
<b>NX7338BF-AA</b>	1310nm	70mW min
<b>NX7339BB-AA</b>	1310nm	25mW min
<b>NX7537BF-AA</b>	1550nm	120mW min
<b>NX7538BF-AA</b>	1550nm	60mW min
<b>NX7539BB-AA</b>	1550nm	20mW min

\*MMF Fiber

#### Uncooled Lasers in CAN Packages

Part Number	Wavelength	Output Power
<b>NX5330SA</b>	1310nm	200mW min
<b>NX5530SA</b>	1550nm	100mW min

#### Uncooled Lasers in Coaxial Packages with Monitor Photodiode

Part Number	Wavelength	Output Power
<b>NX7335AN-AA</b>	1310nm	20mW min
<b>NX7335BN-AA</b>	1310nm	20mW min
<b>NX7535AN-AA</b>	1550nm	15mW min
<b>NX7535BN-AA</b>	1550nm	15mW min

OTDR

## APD Detectors for OTDR

**NEC Electronics cooled and uncooled APD detectors for mainframe and portable OTDR test equipment and subassemblies**

### FEATURES

#### For mainframes

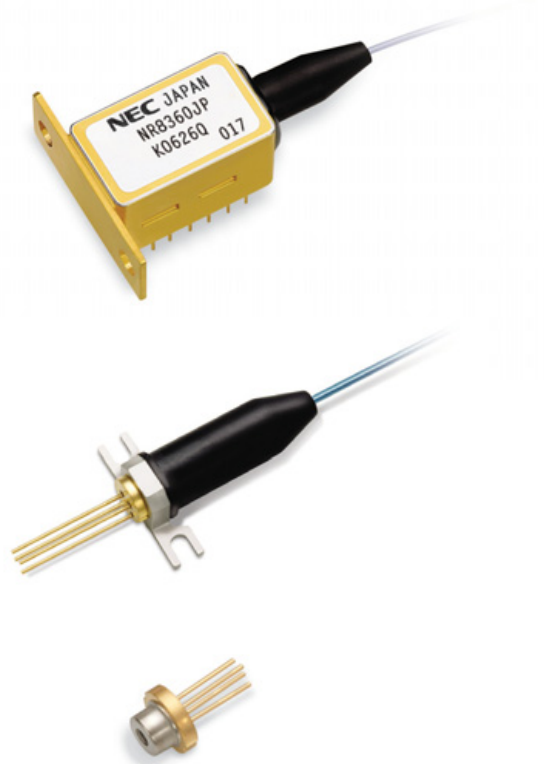
- Small dark current, high quantum efficiency
- Internal thermoelectric coolers
- Hermetically-sealed DIP packages

#### For portable test equipment

- Low cost, uncooled coaxial packages
- Single and multimode models
- Small dark current, high quantum efficiency, high speed response

#### For subassemblies

- 30 $\mu$ m diameter APD
- 80 $\mu$ m diameter APD optimized for MMF
- 5.6mm CAN package



### MODELS

Part Number	Package	Note
NR8360JP-BC	DIP	Cooled
NR8300FP-CC	Coaxial	Uncooled SMF
NR8800 Series	Coaxial	Uncooled MMF
NR6300EZ	CAN	Uncooled
NR6800 Series	CAN	Uncooled, optimized for MMF

OTDR

## CAN Lasers

### NEC Electronics CAN lasers for SFF/SFP transceivers and bi-directional FTTx modules

#### FEATURES

- Fabry-Perot and DFB models available
- 1310nm, 1490nm and 1550nm models
- Speeds to 8G
- Wide operating temperature ranges



#### MODELS & APPLICATIONS

##### DFB Lasers

Part Number	Application
<b>NX6308 Series</b>	P2P, OC-12, 1.25 G GPON (1310 nm)
<b>NX6309 Series</b>	P2P, OC-12, 1.25 G GPON (1310 nm)
<b>NX6311 Series</b>	4 G Fibre Channel (1310 nm)
<b>NX6330 Series</b>	8 G Fibre Channel (1310 nm)
<b>NX6410 Series</b>	OC-48 FTTH PON (1490nm)
<b>NX6411 Series</b>	OC-48 FTTH PON (1490nm)

##### Fabry-Perot Lasers

Part Number	Application
<b>NX5320 Series</b>	4 G Fibre Channel (1310 nm)
<b>NX5321 Series</b>	OC-12 FTTH PON (1310nm)
<b>NX5322 Series</b>	OC-12 FTTH PON (1310nm)
<b>NX5323 Series</b>	1.25 G FTTH PON (1550nm)
<b>NX5521 Series</b>	OC-12 FTTH (1550nm)
<b>NX5522 Series</b>	OC-12 FTTH (1550nm)

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