

1270nm Edge Emitting Narrow Farfield DFB Laser 2.5 Gbps

Rev. V1

Description

The 127D-02x-VCT11-xxx Products are directly modulated 2.5Gbps 1270nm Narrow Farfield (NFF) DFB laser diode chips. These products utilize a patented Etched Facet Technology enabling low cost. Product is available as tested die package in blue tape or gel pack.

Key Features

- Small size die: 265 x 250 x 100um
- 1270nm wavelength
- Narrow beam divergence angle (NFF)
- Direct modulation up to 2.5Gbps
- Uncooled operation, from -40°C to 95°C
- Edge emitting laser (EEL)
- RoHS compliant and design for Telcordia-GR468

Key Benefits

- High fiber coupling efficiency
- Design for non-hermetic package
- On-wafer mapping/screening
- 100% tested over temperature

Applications

- NG-PON

ELECTRO-OPTICAL CHARACTERISTICS (T=25°C unless otherwise specified)						
Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Threshold Current	T=25°C T=85°C T=95°C	I_{th}	-	13 32 -	15 40 45	mA
Optical Output Power @ 25°C	$I_{th}+20mA$	P_0	8	-	-	mW
Slope Efficiency @ 25°C	$I_{th}+20mA$	η	0.40	-	-	mW/mA
Slope Efficiency @ 85C Slope Efficiency @ 95C	$I_{th}+20mA$	η	0.20 0.18	-	-	mW/mA
Operating Voltage	$I_{th}+20mA$	V_{op}	-	-	1.6	V
Operating Current	T_{op}	I_{op}	-	-	$I_{th}+40$	mA
Center Wavelength	Over-temperature I_{op}	λ_c	1260	1270	1280	nm
Temperature Dependence of Center Wavelength	CW	$\Delta\lambda/\Delta T$	-	0.1	-	nm/°C
Side-mode Suppression Ratio	$I_{th}+20mA$	SMSR	35	40	-	dB
Farfield (Vertical) Farfield (Horizontal)	$I_{th}+20mA$	θ_v θ_h	-	13 17	18 20	degrees
Resistance	$I_{th}+20mA$	R	-	8	10	Ohm
Small Signal Modulation Bandwidth (3dB)	I_{op} , 25°C I_{op} , 85°C/95°C	BW_{3dB}	4 4/3.5	-	-	GHz
Rise Time (10-90%)	$I_{th}+20mA$	t_r	-	-	100	ps
Fall Time (10-90%)	$I_{th}+20mA$	t_f	-	-	100	ps
Relative Intensity Noise	$I_{th}+20mA$	RIN	-	-	-130	dB/Hz

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Absolute Maximum Ratings ⁽¹⁾						
Parameter	Condition	Symbol	Min.	Typ.	Max.	Unit
Operating Temperature	Top	T _{op}	-40	-	95	°C
Storage Temperature	-	T _{st}	-40	-	100	°C
Optical Output Power	CW	P _o	-	-	20	mW
Laser Reverse Voltage		V _R	-	-	2	V
Laser Forward Current		I _{op}	-	-	120	mA

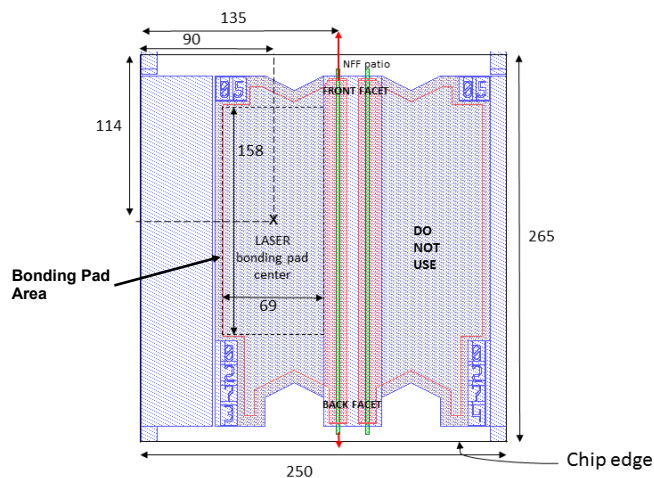
- (1) Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. These are absolute stress ratings only. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of the data sheet. Exposure to absolute maximum ratings for extended periods can adversely affect device reliability.

Bond Pad (w x l) = 158μm x 69μm

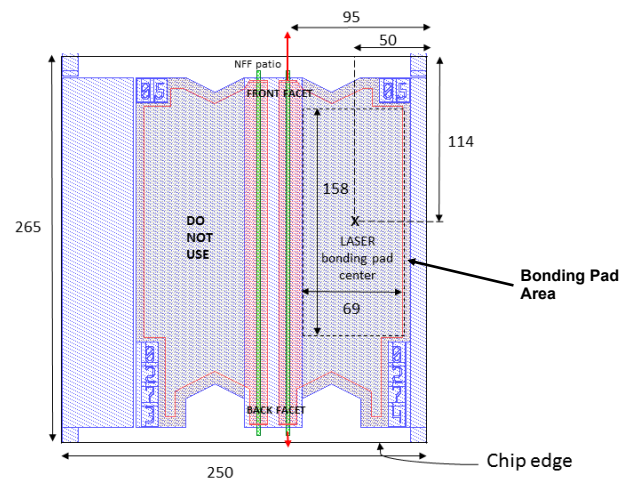
Chip Dimensions (w x l x h) = 265μm x 250μm x 100μm

Die Thickness = 100μm ± 10μm

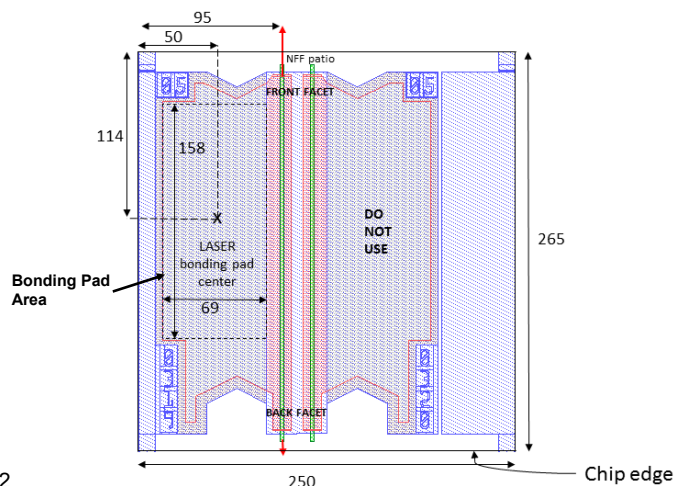
LEFT (ridge) - EAST (chip)



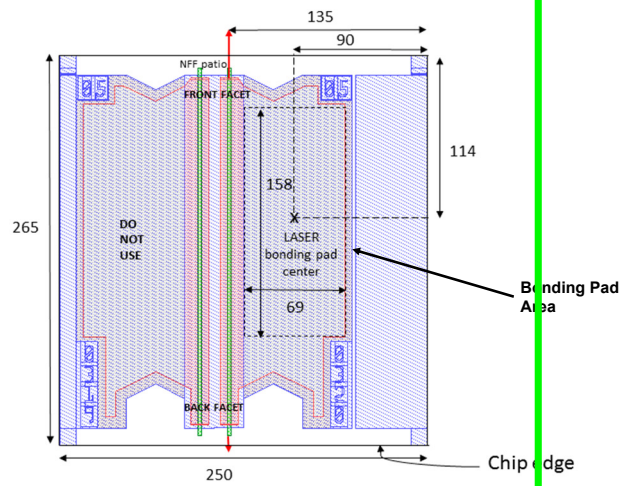
RIGHT (ridge) - EAST (chip)



LEFT (ridge) - WEST (chip)



RIGHT (ridge) - WEST (chip)

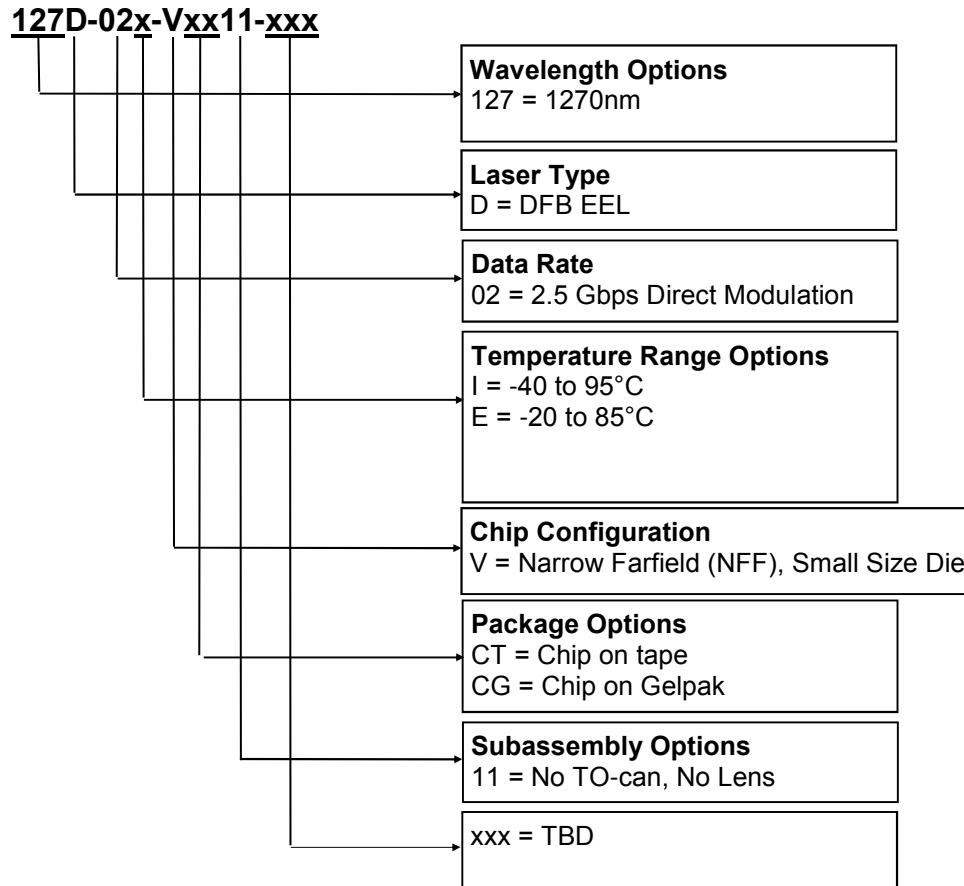


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Ordering Information:



Example:

127D-02I-VCT11, 2.5Gbps NFF Small Size Die DFB laser chip, 1270nm, SE=0.40mW/mA min, -40 to 95°C, chip on tape.

“PPR” is added in the end when it’s in pre-production stage, ie. 127D-02x-Vxx11-PPR.

Device Handling

- InP chips are inherently fragile and easily damaged. Special caution should be used when handling. Do not handle with tweezers. A vacuum tip with a flat surface is recommended. Facets should not be touched.
- Suggested bonding condition:
 - ◊ Refer to the die bond machine manufacturer’s recommendations for the bonding conditions.
- Suggested burn-in conditions:
 - ◊ Chip heatsink temperature: 100°C
 - ◊ Current: 100mA
 - ◊ Time: 24 hours

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ESD and EOS

The 127D-02x-Vxx11-xxx **shall** be capable of withstanding an ESD voltage of 500 volts (Class III as defined by Telcordia standard TR-NWT-000870) with no permanent degradation in performance or reliability. Thermal damage (EOS) may occur to the 127D-02x-Vxx11-xxx if it is subjected to a current or voltage that is beyond the specification limit of the device. EOS may result from improper ESD handling, improper power sequencing, a faulty power supply or an intermittent connection.

Proper turn-on sequence:

- All ground connections
- Most negative supply
- Most positive supply
- All remaining connections

Reverse order to turn-off.

Laser Safety

This product meets the appropriate standard in Title 21 of the Code of Federal Regulations (CFR). FDA/CDRH Class 3b laser product. This device has been classified with the FDA/CDRH under accession number xxxxxxxx.

All Versions of this laser are Class 3b laser product, tested according to IEC 60825-1:2007/EN 60825-1:2007.

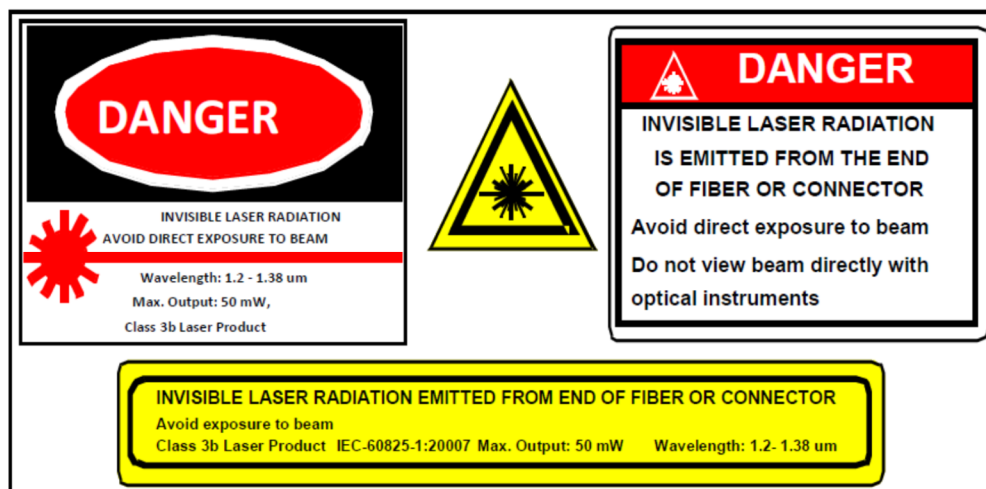
Wavelength = 1.2 to 1.38 μm

Maximum power = 50 mW

Because of size constraints, laser safety labeling (including an FDA class 3b label) is not affixed to the module, but attached to the outside of the shipping carton.

Product is not shipped with power supply.

Caution: Use of controls, adjustments and procedure other than those specified herein may result in hazardous laser radiation exposure.



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