



An indie Semiconductor Company

# LXM Narrow Linewidth DFB Laser Module

2024 EPIC Members New Product Release June

Patrice Dionne

Product Line Manager, Optical Sensing



# TeraXion in a Nutshell

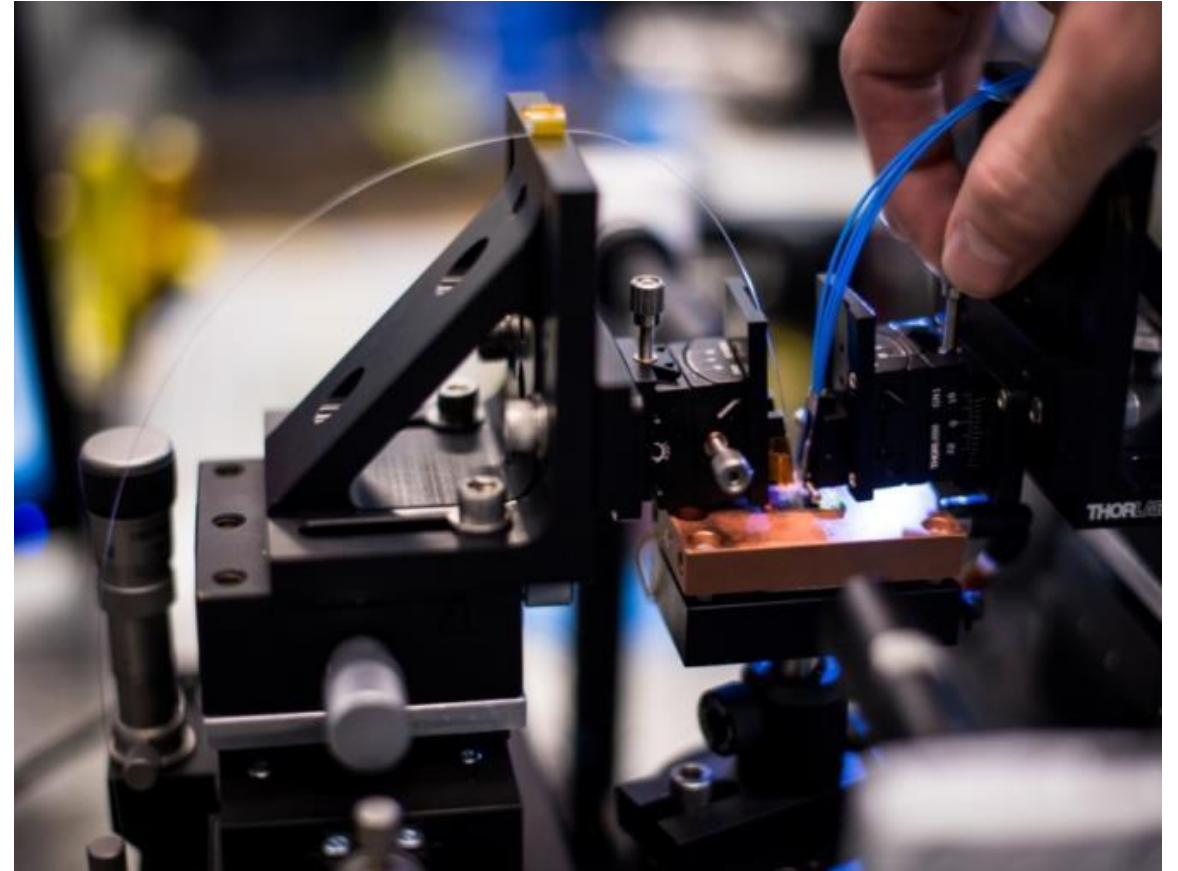
- » **Founded in 2000**
- » **Designs and manufactures innovative photonic components**
- » **> 200 employees**
- » **3 Markets**
  - » Optical Communications
  - » Optical Sensing
  - » Laser Systems
- » **An indie Semiconductor company**



# Our Technological Expertise

Fiber Bragg Gratings

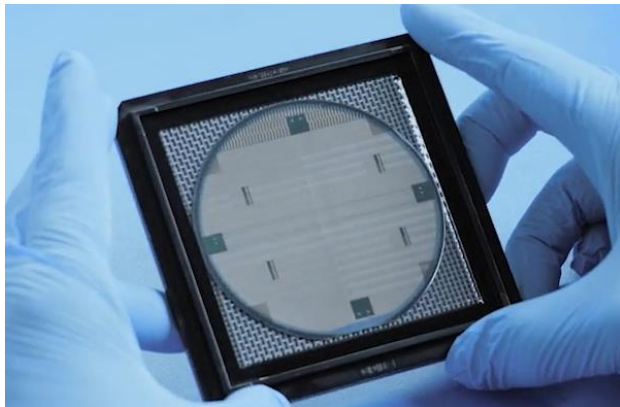
Low Noise Lasers



# **LXM Product and Technology Differentiators**

# TeraXion's LXM: A New Generation of Narrow-Linewidth Lasers

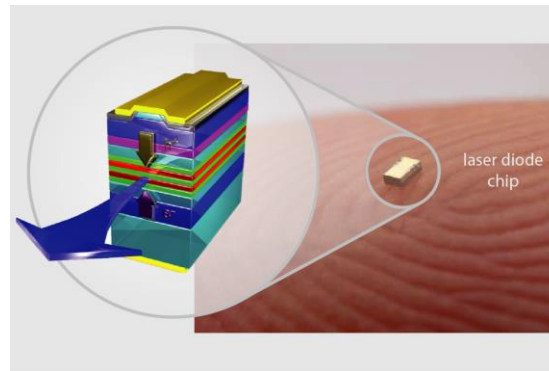
*Proprietary DFB laser diode design*



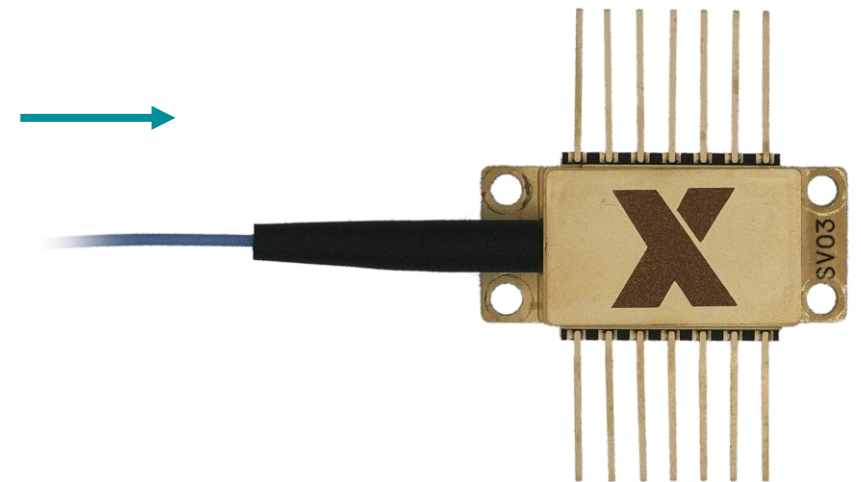
- Proprietary DFB laser diode design
  - Canadian fab partner



A single wafer provides thousands of lasers

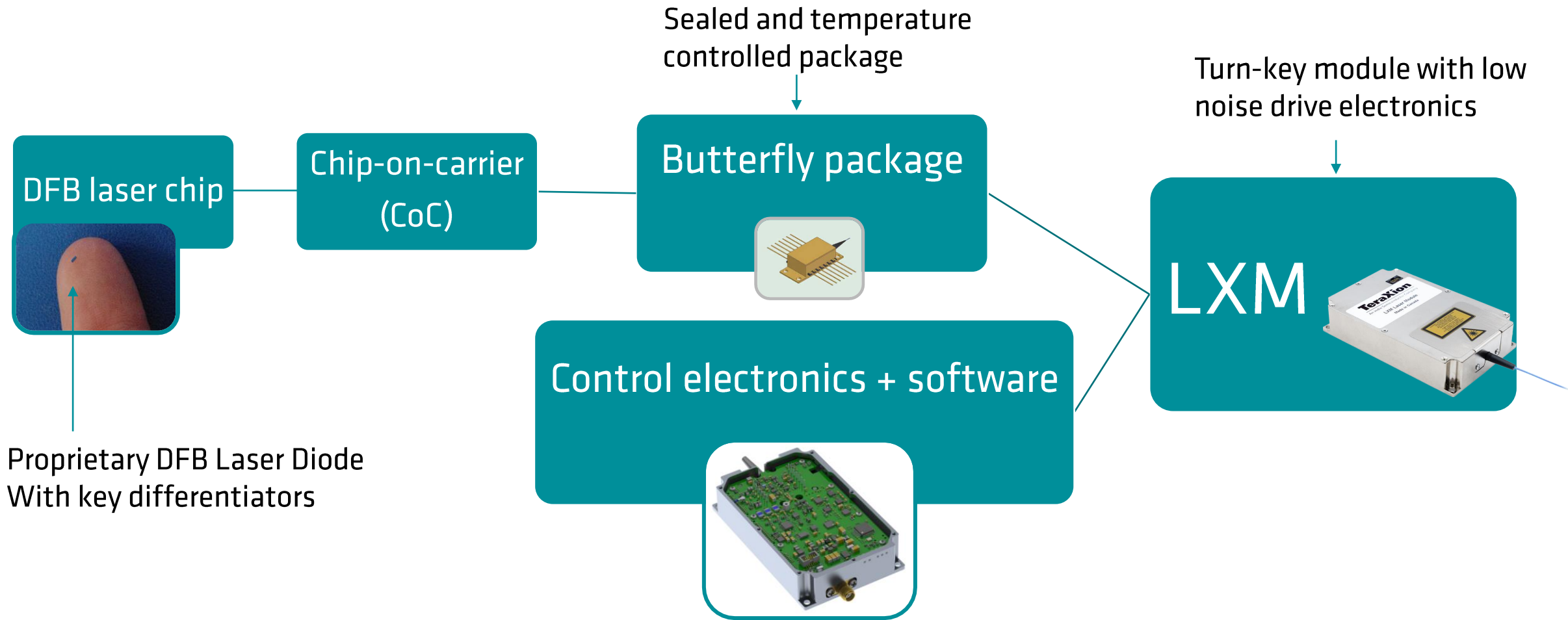


DFB laser diode packaged into a 14 pins butterfly package:



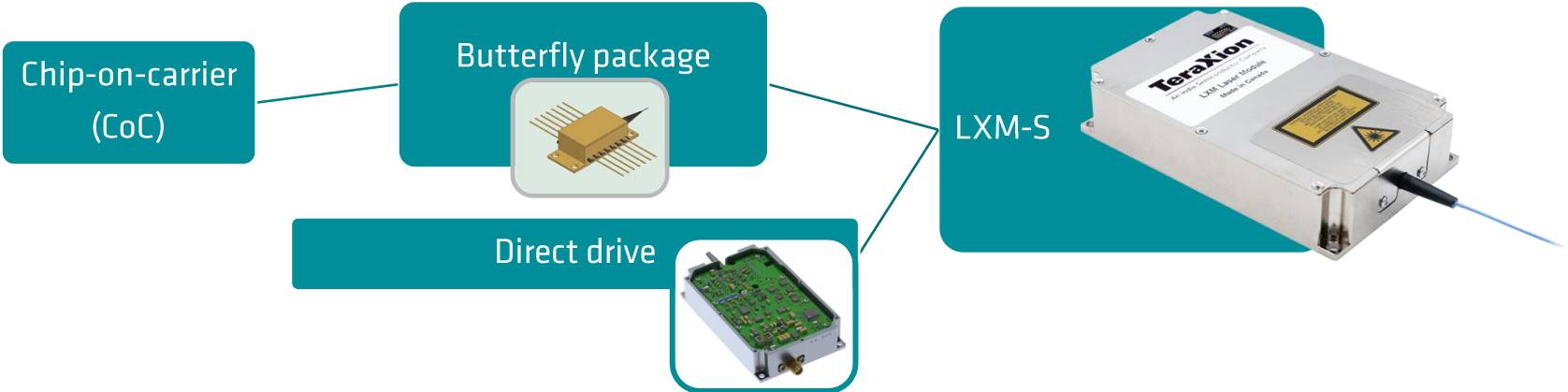
# TeraXion's LXM: A New Generation of Narrow-Linewidth Lasers

*From Proprietary DFB Laser Chip to Laser Module*



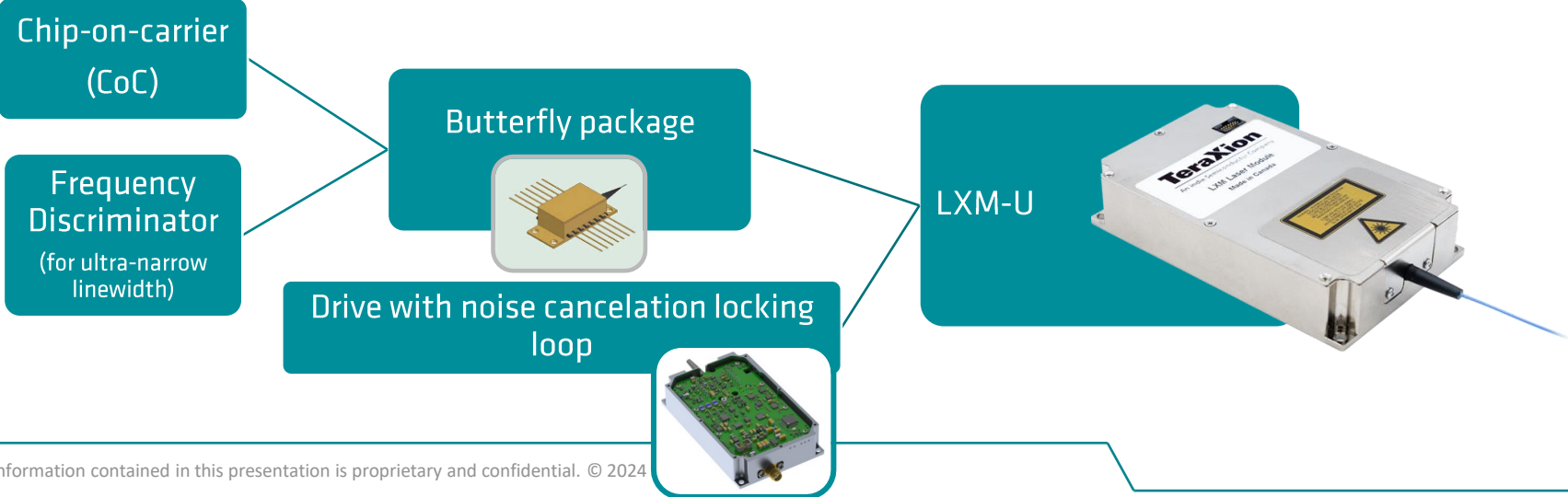
# TeraXion's LXM: A New Generation of Narrow-Linewidth Lasers

## LXM-S vs LXM-U



- <25 kHz linewidth
- >5 GHz modulation amplitude (10 kHz rep rate)

### LXM-S



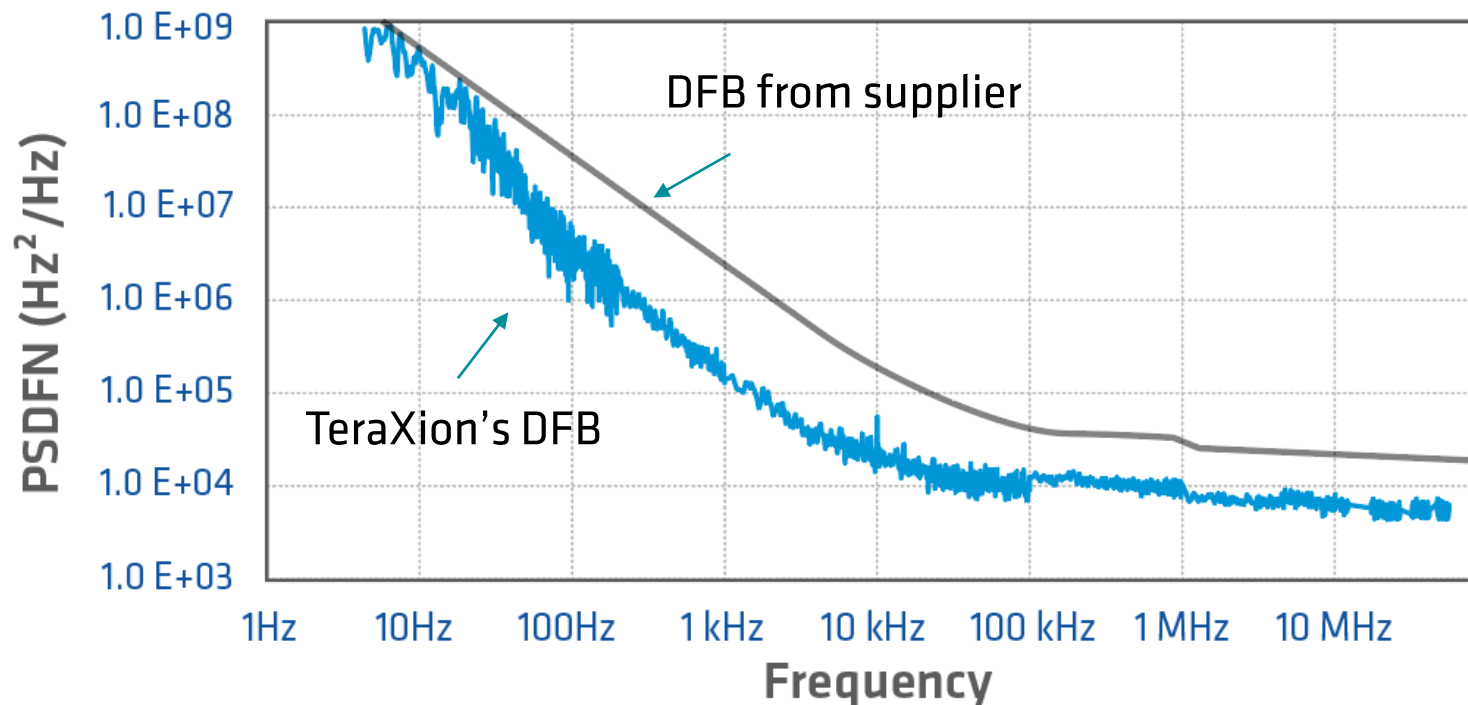
- <0.2 kHz linewidth
- 0.2 GHz modulation amplitude

### LXM-U

# Technology Differentiators at the DFB Chip Level

## Intrinsically narrow linewidth

- Frequency noise below is based on equivalent electronics: superior DFB grating design and epitaxy provide frequency noise improvement



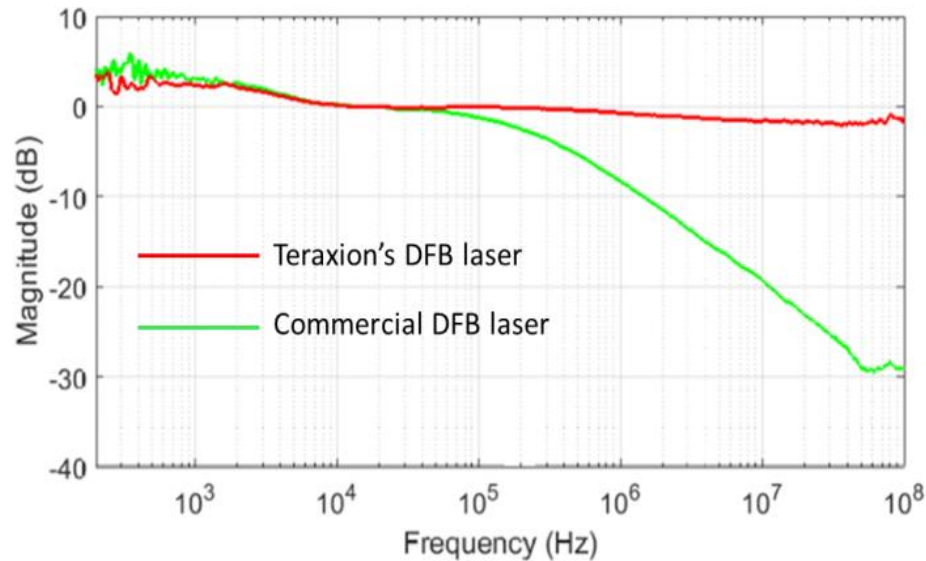


# Technology Differentiators at the DFB Chip Level

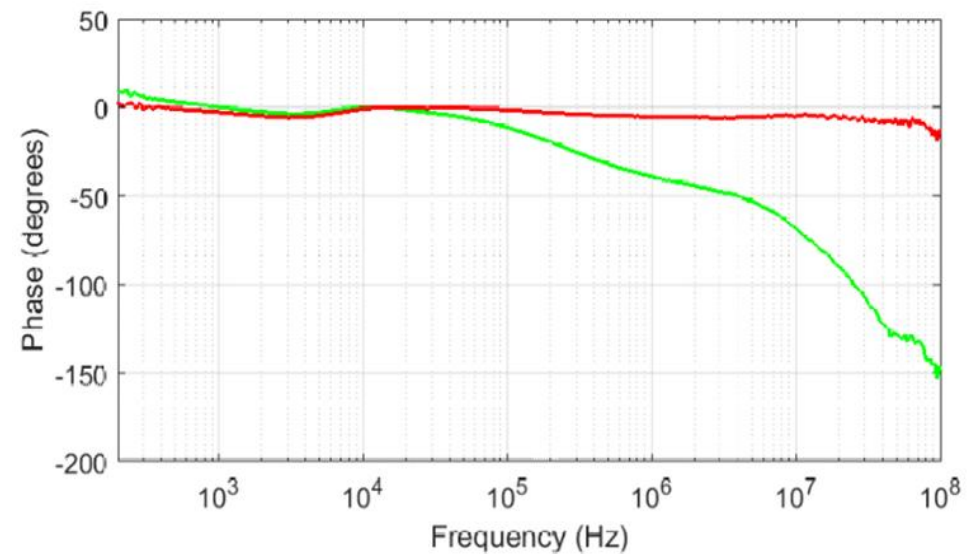
## Flat FM response

- Allows high performance frequency locking (LXM-U) and phase locking of the laser
- Fundamental to maintain frequency modulation properties at fast repetition rate (LXM-S)

**Flat FM Response: Amplitude**



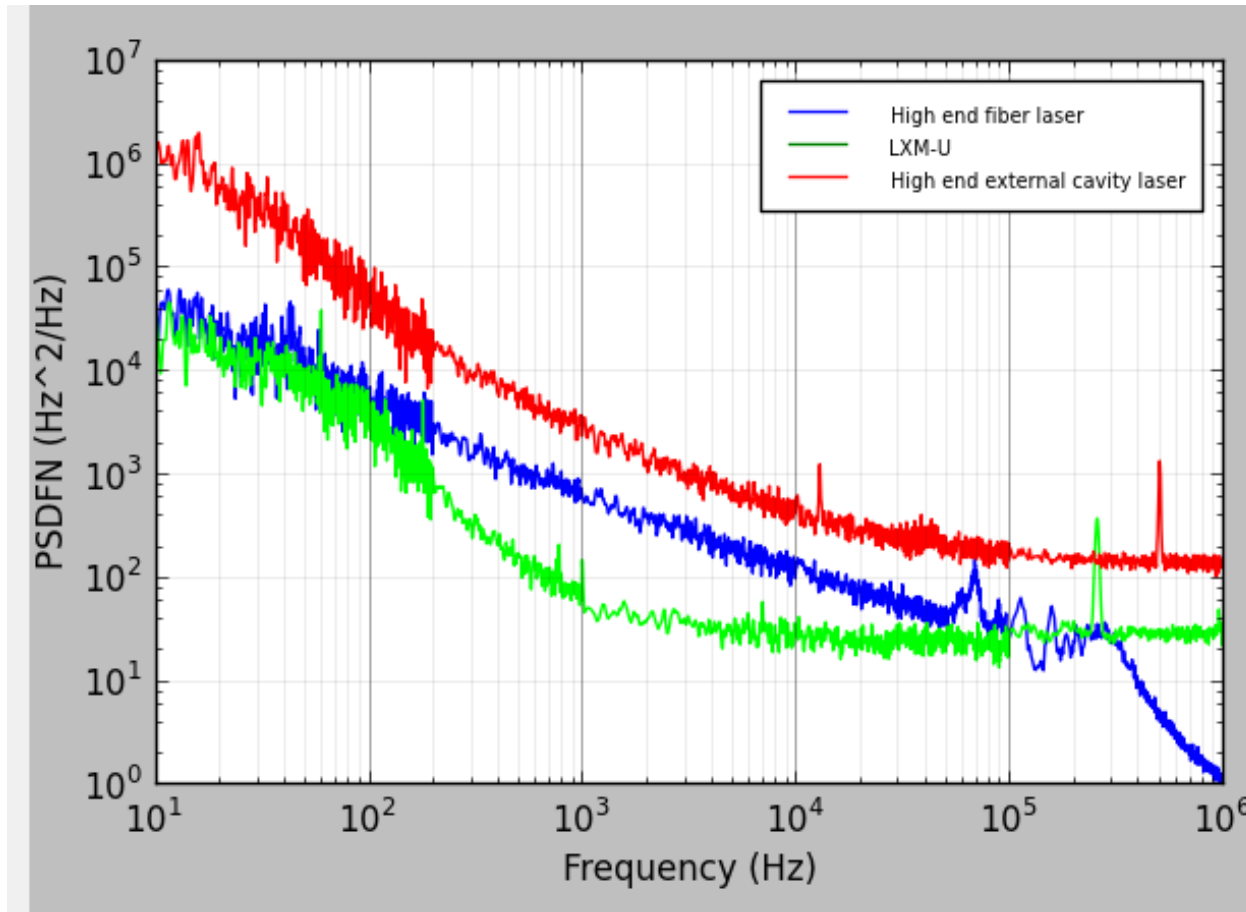
**Flat FM Response: Phase**



# LXM Product Differentiators

## LXM-U Differentiator

- Ultra narrow linewidth, better than high end fiber laser between 100 Hz and 100 kHz:

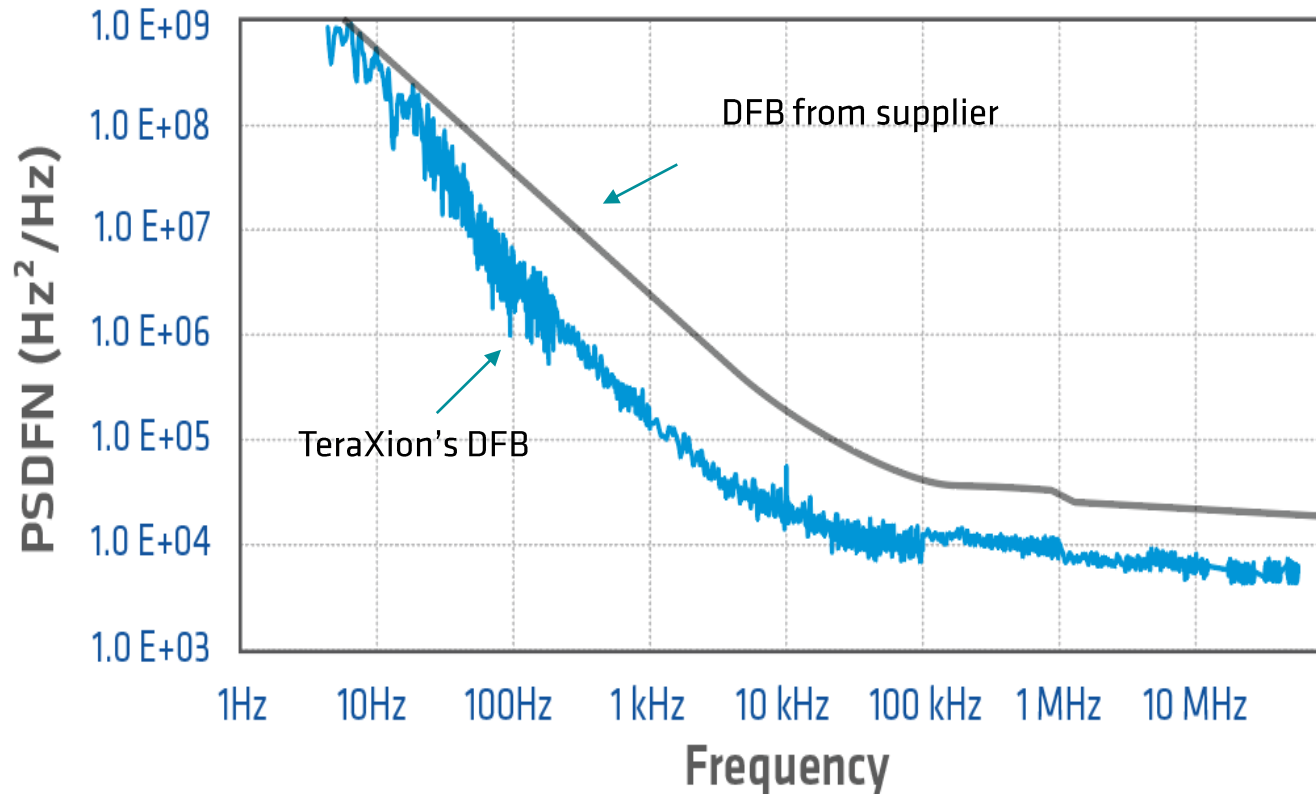


# LXM Product Differentiators

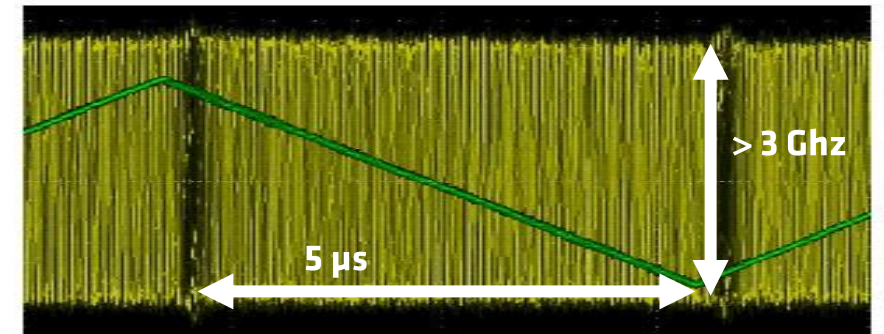
## LXM-S Differentiator

- Fast frequency modulation properties combined to intrinsic narrow linewidth

Frequency Noise Comparison



FMCW Chirp and Beat Signal



# Rugged and Reliable Lasers Delivered on Spec

*18 Years Delivering High Quality Semiconductor DFB Laser Modules*

**LM & NLL DFB laser module family commercialised since 2006**



**Now LXM brings key performance differentiators!**

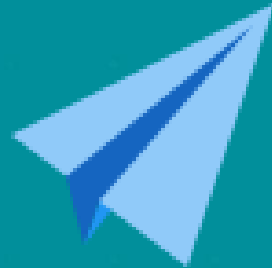


- **History of stability, reliability, ruggedness**
  - High quality low-noise electronics and best-in-class packaging know-how
  - 18 years delivering high quality semiconductor DFB laser modules
- **Low noise lasers delivered on spec, high level of support**
  - Exhaustive factory testing, complementary test & instrumentation know-how

# Contact TeraXion!



+1 418 658-9500  
+1 877 658-8372



[info@teraxion.com](mailto:info@teraxion.com)



[@TeraXion](https://www.linkedin.com/company/teraxion)



Patrice Dionne  
Product Line Manager, Optical Sensing  
[pdionne@teraxion.com](mailto:pdionne@teraxion.com)