SMART PHOTONICS

Bringing your innovation to life

C-BAND TUNABLE LASER LEAFLET

C-BAND INTEGRATED TUNABLE, NARROW LINEWIDTH LASER FOR ITLA IMPLEMENTATION

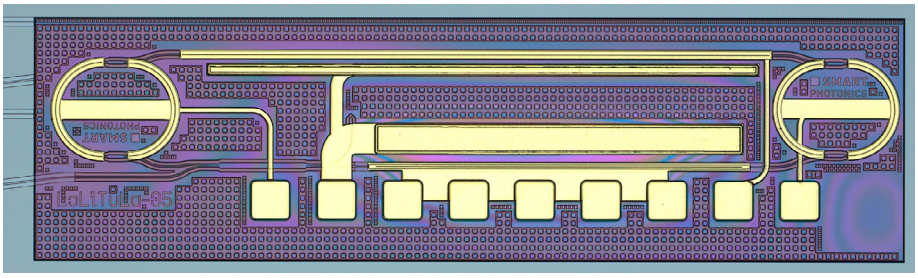


Figure 1: Top view picture of the integrated tunable laser (real world representation may differ based on customer design).

Description

SMART Photonics offers a Narrow Linewidth Tunable Laser reference design based on its unique PDK. This external cavity laser (ECL) is equipped with a high output power, broadband gain section and a tunable dual ring Vernier filter which provides the advantage of narrow linewidth, high output power and a wide and fast tunability. With a tuning range of more than 35nm, the laser wavelength covers the full C band. The laser is especially designed to deliver CW signals to enable coherent optical detection in optical networks. Due to its small form factor, it allows for easy integration into sub-assemblies for small form factor pluggable optics like QSFP. Other applications of the laser design can be found in LiDAR or Sensing. For advanced applications, the laser design can be easily integrated into more complex InP PIC (Photonic Integrated Circuits) designs.

Wavelength and Optical Output Power Enhancements

Next to the C-band tunable laser also an O-band tunable laser reference design is offered that is based on the O-band platform of SMART Photonics. An L-band tunable laser and a high power laser are being developed and are expected to be available later in 2025. In addition to the discrete versions of these lasers also integrable versions are available, as part of the extensive SMART Photonics PDK. The complete tunable laser roadmap is given on the backside.

SMART Photonics PDK

SMART Photonics offers a generic process for manufacturing InP based photonic integrated circuits. This process allows for fast prototyping and low cost PIC development without compromising performance and functionality. Custom designed photonic integrated circuits can be developed using the SMART Photonics Process Design Kit (PDK). This PDK consists of an extensive building block library. For making a design, no in-depth knowledge of the technology is required for the user.
The ECL reference design, that can be used by our customers in their laser design track, demonstrates the functionality of a SMART PDK based ECL. By customization of this reference design the ECL performance can be adjusted to the customer needs.

SMART Photonics
High Tech Campus 37
5656 AE Eindhoven
The Netherlands

T: +31 40 304 64 33
info@smartphotonics.nl
www.smartphotonics.nl

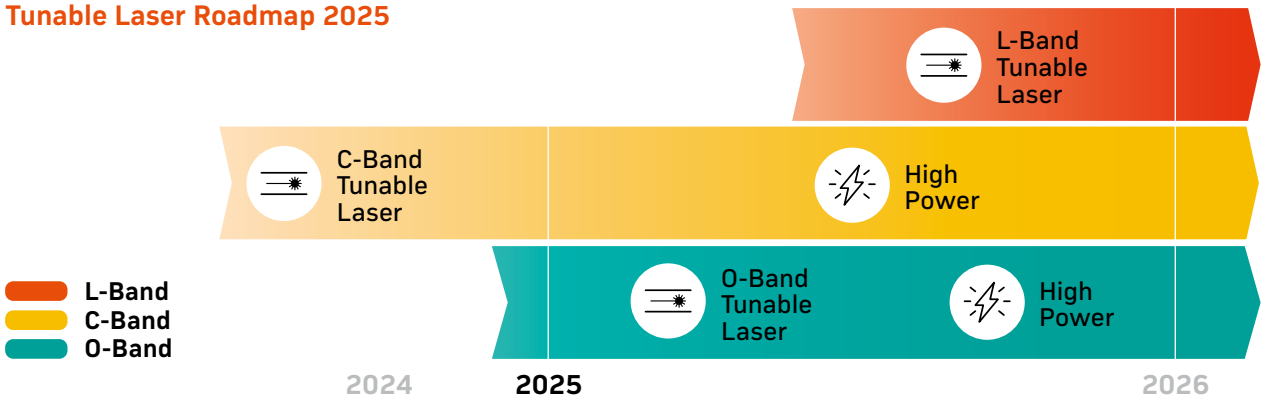
Benefits

- Reliable, integrable light source with a wide tuning range, narrow linewidth, and enough power to drive SiP platforms for coherent communication networks.
- Output power of 15 dBm meeting the demands of component and PIC level integration.
- Single integrated InP PIC design, reducing size, cost, and power consumption.
- Narrow Linewidth of approximately 100 kHz enabling easy integration in Coherent Optics and LIDAR systems.
- Fast wavelength switching speed and reduced self-heating compared to devices employing thermal tuning, supporting the needs of sensing and LiDAR systems.

Applications

- 100G/400G/800G/1.6T Coherent Optics SiPh based components and systems, for the Network Edge, DCI and Metro/Long Haul domains.
- Fit for Nano (13x7x3 mm) or smaller ITLA packaging.
- LiDAR FMCW systems.
- Sensors for Infrastructural Health Monitoring.
- Medical or Industrial

Tunable Laser Roadmap 2025

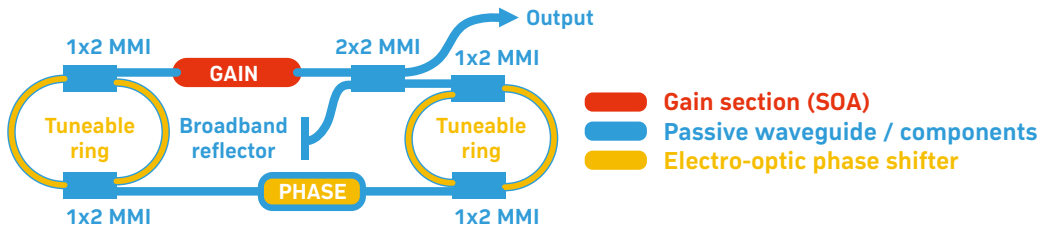


Typical Optical Performance

PARAMETER	UNIT	TYP.	REF.
Center Wavelength	nm	1550	1
Operating Output Power	dBm	15	2
Lowest Emission Wavelength	nm	1520	1
Highest Emission Wavelength	nm	1580	1
Tuning Range	nm	35	1
Linewidth	kHz	100	

References
1. O-band and L-band available in 2025: see roadmap 2. High power laser available in 2025: see roadmap

Reference Design Schematic



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Integrity is key in the services SMART Photonics offers. As an independent Pure Play InP Foundry, we work at the sole discretion of our customers and their businesses.

Teams of highly experienced experts support all of our clients' requests. Our production services range from epitaxial growth and regrowth to coating and testing of the individual chips. We accommodate both proof-of-concept and volume manufacturing.

We are a European based manufacturer with production and research facilities located in Eindhoven.

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