

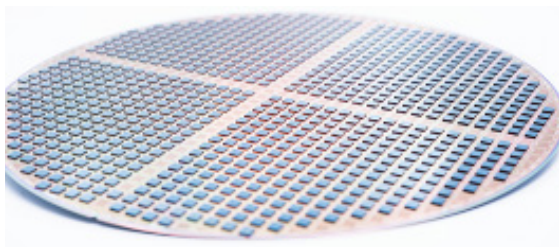


embracing a better life

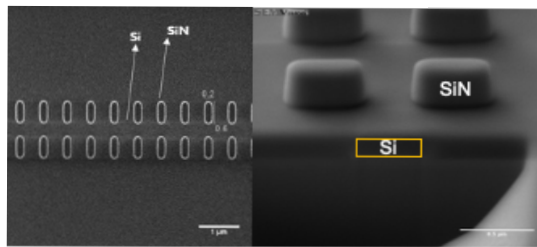
IMEC'S ADVANCED PHOTONICS AND SOLID STATE OPTICAL BEAMFORMING TAILORED TO YOUR APPLICATION

Imec's state-of-the-art industrial 200mm (8-inch) and 300mm (12-inch) photonics capabilities based on Si and SiN platforms have been used to demonstrate optical beamforming. Many applications in optical communication and sensing requiring integrated photonics at ultra-low optical losses will benefit from such technology. Solid-state scanning for LiDAR illumination with a compact beam-scanner is one of them. Imec has successfully demonstrated 40° scanning range in near infrared.

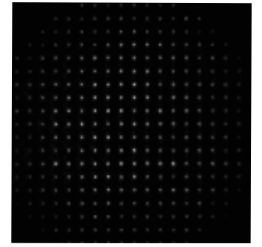
Conventional silicon photonic technologies are limited in the amount of power they have available to shine light off a beamforming chip. Si and/or SiN photonics can be used for different solid state applications at various wavelengths from visible to near infrared, such as LiDAR, that requires a miniature light scanner with pulsed or continuous illumination. Other components requiring low optical loss and high power handling (at Watts levels) can also be integrated on the same chip, including detection, which results in a compact system at low cost. Imec is continuously researching and improving on its photonics material build-up to prepare for the next level on system integration. Whether it is for a product or to advance your research, please contact us to know more about our offering.



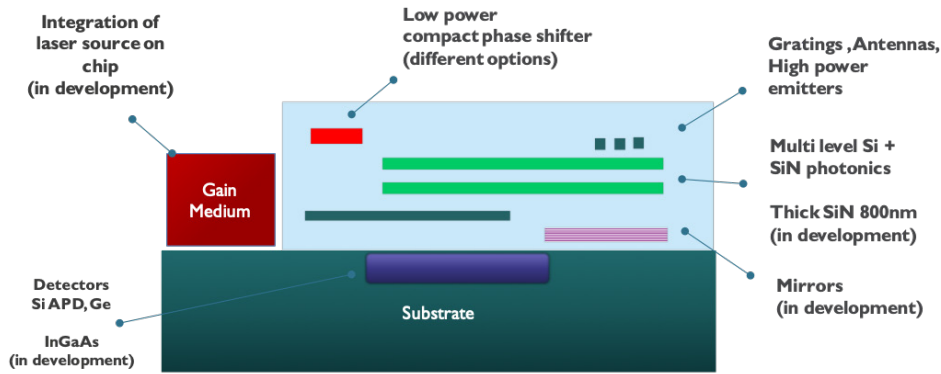
Wafer-scale PIC manufacturing



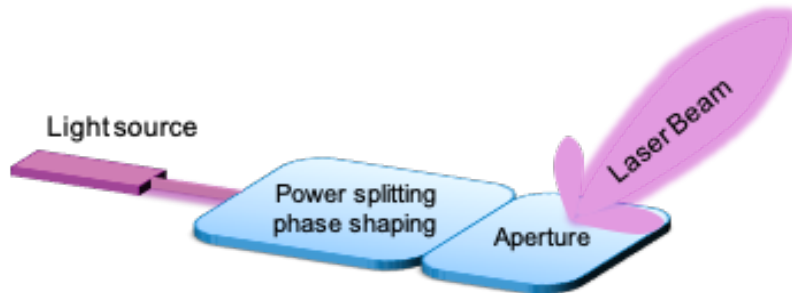
SEM image of SiN-on-Si optical phase array antenna



Wide field of view using optical phase array



Cross-section of fully integrated photonic Lidar engine with integrated laser and PD.



Integrated photonics for beamforming and sensing

KEY BENEFITS

- **Full photonics solid-state solution:** a system that requires no mechanical parts, so it is much easier to assemble and has a higher reliability.
- **High-power and low-divergence beam:** imec's optical beamforming technologies allow injecting a high optical power (30W) with low beam divergence ($<1^\circ$), suitable for long range measurements.
- **Highly integrable:** due to the use of semiconductor technologies, the system can be fully integrated with all electronics into a System-on-Chip and/or a System-in-a-Package.
- **Affordable:** by using semiconductor technology, the cost is drastically reduced.

APPLICATIONS

- Autonomous vehicles
- Aerial drones
- Automation of factory robots
- Service robots in hospitals and other customer oriented environments
- Assisted surgery
- Intelligent machine vision and robotics

OUR OFFERING

System Feasibility Study:

- Mapping of photonics platform to system specification
- Architecture: Integration of laser source and detector

Component Manufacturing:

- Using 200 mm & 300 mm processing lines
- Based on Si, SiN or Si + SiN platforms and custom process modules
 - Access to PDK for standard flows
 - OPA design support
 - Custom device simulation & design kits
 - Early access to non-standard devices
 - Low power phase shifter
 - Mirror integration
 - High power laser integration
- Applicable to numerous other components:
 - WDM, combs, laser
- Transferable to volume

CONTACT US

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