

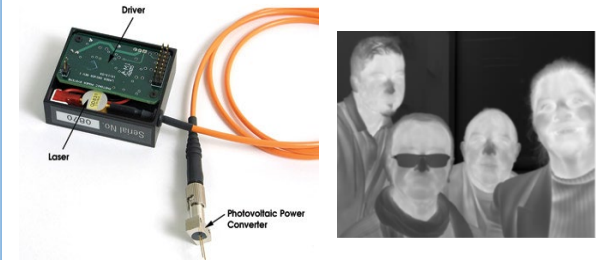
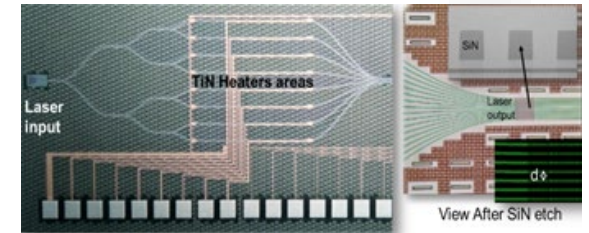
Technology Field 5: Compound Materials



Summary of achievements at TF level

IPCEI-ME created a landscape to develop a European CS industry for foundry services and components to regional and global markets

- New infrastructures through fabs delivering vertically-integrated device manufacturing, foundry and specialist substrate services, providing increased employment in Europe.
- Fundamental progress in fibre-optic and mobile communications, satellite technologies (power, comms) and advanced PV and infra-red sensor solutions.
- Focus on scalability, miniaturization and integration (with e.g. Si), ultimately to realize the first industrial deployment of these advances
- Increasing the offer of these platforms through open-access materials and device foundries, reducing barriers of adoption for SMEs and Universities within novel and functional design ecosystems
- Increasing awareness and facilitating the market take-up of these new technologies for a green and digital future
- Addressing societal challenges -efficient power switching, autonomous vehicles, wireless communications, 5G, IoT, Big Data, sensing in agriculture, healthcare and medicine, and efficient LED lighting



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OSRAM – Tooling and processes now 8” capable. FID established in a number of product lines: Miniaturized LEDs in various die sizes/colours for RGB, general and special lighting; Deep UV LEDs with improved component efficiency, output power (CoViD-19 pandemic needs); Pixelated 2D LED arrays for compact and energy efficient smart automotive headlamps.



AZUR SPACE – AZUR performed the first industrial deployment of novel GaAs-based high efficiency energy converter devices for application in opto and power electronics. Moreover, a new fab for epitaxy of GaN-on-Si transistor structures is under construction and shall be able to supply the European value chain for power electronics by the end of 2022.



STMicroelectronics - Photonic technologies for image sensing: Optical Phase Arrays (OPA) in Si and SiN and Resonant gyroscopes. Improvements in SiGe BiCMOS technologies @ 130nm and 55nm - low noise/high frequency (>500GHz) HBT transistors; metal interconnect stacks; BiCMOS 130nm with HR substrate for integration of high-quality switches.



Soitec - New generations of Photonics SOI substrates in FID. Further development on innovative Photonics substrates - SOI, double SOI, InP on Silicon; InP chips on 200mm Si wafers; 150mm InGaN on Sapphire wafers for micro-LED evaluation.



CEA-Leti – Development of: Silicon Photonics on 300mm Si and for LIDAR applications; larger diameter SOI/GeOI photonics substrates, new Differentiating substrates, transfer & bonding activities; 100mm II-VI Pilot Line for Focal Plane Arrays.



Lynred – High performance, high operating temperature HgCdTe (II-VI) sensors for infra-red detectors for earth observation (drones) – product Galatea MW released - space and science applications.



IQE/Nexperia Newport/SPTS - Enabling a Compound Semiconductor supply-chain eco-system with major cooperation in: InP lasers and Si photonics – telecomms, data centre and healthcare; VCSELs and PV GaAs Manufacturing – datacoms, 3D sensing, LIDAR, UAV, LEO satellites; GaN Power and RF electronics – automotive, wireless comms; CS processing equipment development, packaging & reliability testing.



ICS - Innovative materials and devices – GaAs VCSELs for Quantum Technology applications (atomic clocks and magnetometers); InP PINs and APDs for free-space optical communications